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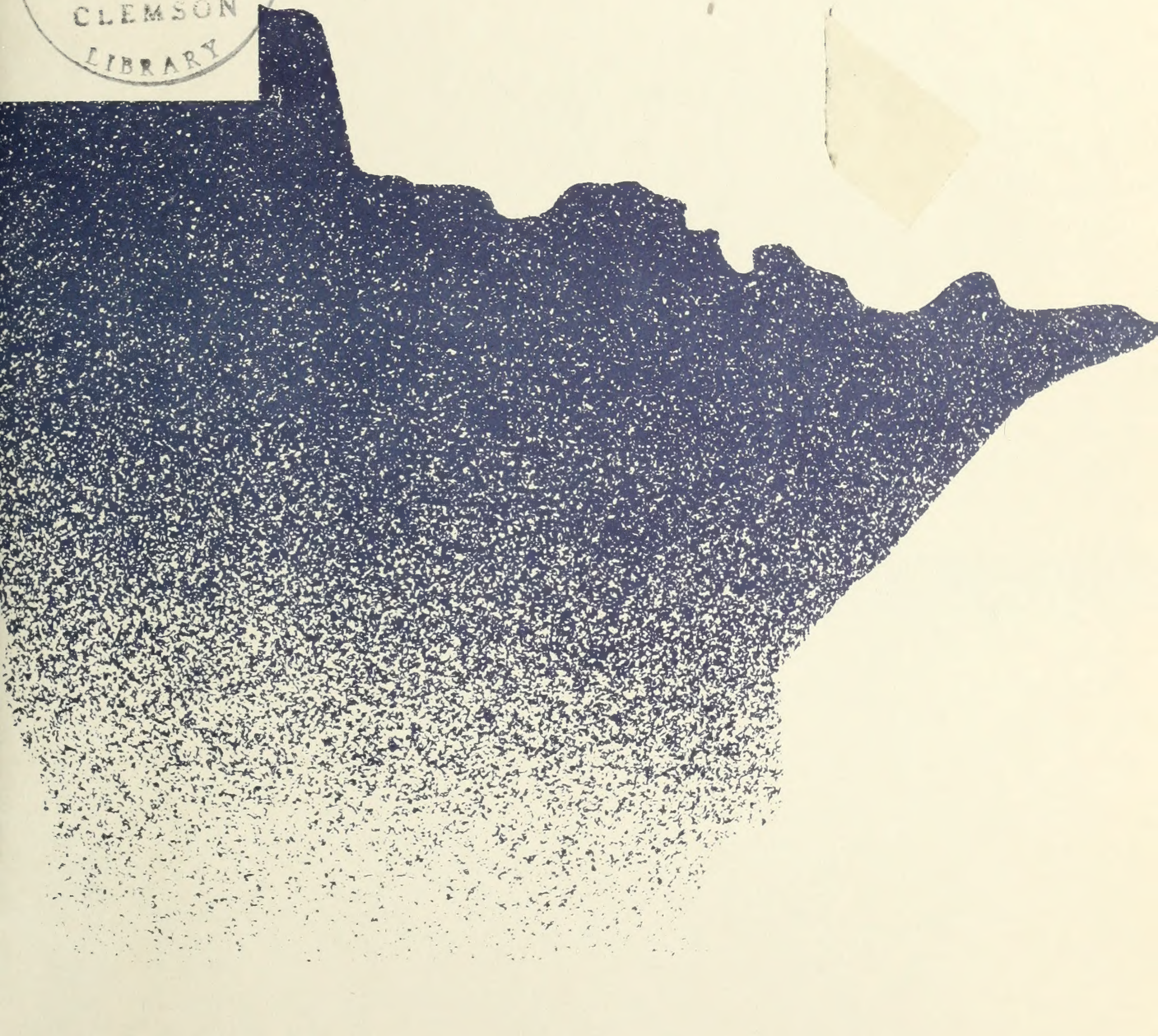
# The Extent and Characteristics of Low Productivity Aspen Areas in Minnesota

Gerhard K. Raile and Jerold T. Hahn



# CONTENTS

*Page*

Data Base ................................ 1

Methods .................................. 2

Results .................................. 3

Discussion ............................... 4

Conclusions .............................. 10

Literature Cited ......................... 10

Appendix ................................. 10

**North Central Forest Experiment Station**
**Forest Service—U. S. Department of Agriculture**
**1992 Folwell Avenue**
**St. Paul, Minnesota 55108**
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# EXTENT AND CHARACTERISTICS OF LOW PRODUCTIVITY ASPEN AREAS IN MINNESOTA

**Gerhard K. Raile,** *Mensurationist,*
*and* **Jerold T. Hahn,** *Principal Mensurationist*

The aspen type in Minnesota occupies about 5.3 million acres, 39 percent of the State's commercial forest land[1] Aspen is the State's major commercial species, accounting for 43 percent of all growing-stock removals for products in 1976 (Jakes 1980). In recent years the use of aspen has grown even larger because of new waferboard plants in the State. Because of the wide extent of the aspen type and its importance to forest industry, there is much interest in knowing the productive capacity of aspen forest land.

Extensive areas of aspen in Minnesota currently produce little commercial timber, because stands are understocked, overmature, or on low sites. Details about the extent, characteristics, and distribution of these low productivity areas have not been available. Lundgren and Hahn (1978) developed a method for assessing the productivity of aspen areas in Wisconsin. A similar method will be used in this report to provide a basis for comparison between Minnesota and Wisconsin aspen forests. In addition, we developed new equations to evaluate aspen site productivity and potential productivity achieved. This report summarizes the current and potential productivity and general location and distribution of the aspen forest type in Minnesota.

## DATA BASE

The data for this study were taken from 3,398 commercial forest plots measured on non-National Forest land during the 1977 forest survey of Minnesota (Jakes 1980). Additional data included 62 aspen plots on the Superior National Forest (measured in 1979) and 62 aspen plots on the Chippewa National Forest (measured in 1980). Each plot consisted of 10 variable radius (37.5 basal area factor prism) points spread equally over approximately 1 acre. Plot locations were determined by placing a systematic grid of 1-acre dots over an aerial photo mosaic of each township. The State was divided into four Survey Units (fig. 1) for computing and for presenting the data by smaller, geographically similar sections.

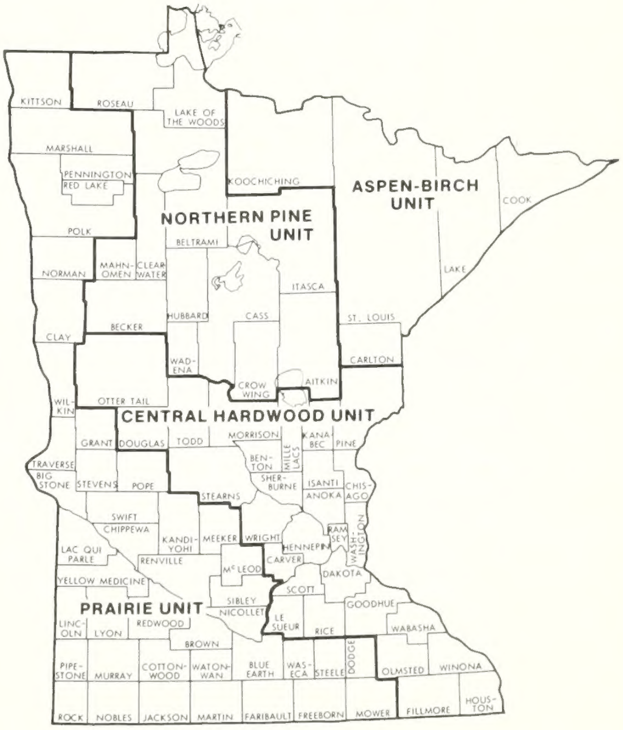

Figure 1.—*Survey units for the 1977 Minnesota Survey.*

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[1] *Commercial forest land and other terms used throughout this paper are defined in the Appendix.*

# METHODS

## Site Productivity

The first step in the analysis was to determine the site productivity of each aspen inventory plot in Minnesota. Site productivity is expressed in cubic feet of growth per acre per year. The current productivity of a stand varies with its age, but for a given rotation length a stand's productivity can be expressed in terms of the mean annual increment over the rotation. Site productivity typically is expressed as the maximum mean annual increment (MMAI) over the range of possible rotation ages.

Yield tables from Kittredge and Gevorkiantz (1929), reporting total peeled cubic foot volume per acre per year in trees 1.0 inch d.b.h. and larger in well-stocked aspen stands, have been used for decades as the standard for determining aspen site productivity in the Lake States. Lundgren and Hahn (1978) used these yield tables to estimate site productivity for aspen in Wisconsin. They developed an equation relating MMAI in cubic feet per acre per year to site index (S) from the table data in Kittredge and Gevorkiantz (1929), resulting in the following equation:

$$\text{MMAI} = -97.53 + 3.5463\,S - .014286\,S^2 \qquad (1)$$

To improve on this estimate of site productivity, we used North Central Forest Experiment Station's Stand and Tree Evaluation and Modeling System (STEMS) (Belcher 1981) to develop an aspen yield function for fully stocked stands. STEMS is a system of computer programs that projects the growth of individual trees in stands. Based on biological principles of forest growth, it offers a flexible, generalized approach to simulating the change of forest trees in stands. STEMS was used to simulate the growth of fully stocked aspen stands from age 5 to 95 over the entire range of commercial aspen site indices (35 to 105). Stand volume and basal area were computed every 5 years. These data were then used to develop the following yield function:

$$V = 30.6\,S^{1.111}\,(1-e^{-.12065\,A})^{5928\,S^{-1.189}} \qquad (2)$$

where

V = Volume of the stand (cubic feet/acre)

S = site index (feet at 50 years)

A = stand age (years).

Iteration was then used with this equation to compute the MMAI for all the aspen stands in Minnesota. We used both the STEMS MMAI and the MMAI from equation 1 to classify each plot's potential site productivity. Except for the least productive sites, the STEMS MMAI is lower than the MMAI from equation (1).

## Potential Achieved

Next, we developed a method to evaluate each plot's achievement of its potential productivity. For several reasons, we used current basal area per acre rather than growth or volume to compare potential achieved to site productivity. First, the actual current annual increment recorded for each inventory plot cannot be compared directly with the MMAI. Current increment is only the net growth for the current year, whereas the MMAI is the maximum average growth throughout an entire rotation.

Second, although we could have used STEMS to project current stands to the end of rotation, many stands are not of pure aspen or of one age, hindering the determination of rotation age.

Third, using basal area to estimate the percent of potential productivity achieved eliminated extensive volume computations and adjustments. Lundgren and Hahn (1978) showed that if we assume stand height is the same for a given age and site regardless of stand density, then the proportion of potential volume achieved on a plot is identical to the proportion of potential basal area achieved.

Lundgren and Hahn (1978) developed the following equation to estimate the potential basal area per acre by fitting a nonlinear function to the basal areas given by Kittredge and Gevorkiantz (1929) for all trees 1.0 inch d.b.h. and larger in well-stocked aspen stands.

$$B = 2.385\,S\,(1-e^{-0.031268\,A}) \qquad (3)$$

where

B = potential basal area per acre for all live trees (square feet/acre)

S = site index (feet at 50 years)

A = stand age (years).

In addition to using equation 3 to estimate the percent achieved, we developed the following model to estimate potential basal area based on the STEMS simulations:

$$B = 102.7S^{.1019}\,(1-e^{-.0486A})^{1.2626} \qquad (4)$$

where B, S, and A are defined above.

To estimate the proportion of potential achieved, the current basal area of the plot was divided by its potential, estimated from equation 3 or 4. With equation 4, the estimated potential basal area of a 30-year-old stand with a site index of 70 would be 113 square feet per acre. If the actual basal area was 68 square feet per acre, the stand would have achieved 60 percent of its potential.

The present basal area of a stand can be obtained directly from each plot record. But should this basal area include all live trees or only growing-stock trees? The first provides a measure of apparent stocking of all trees in a stand and may be most appropriate for a harvest system such as full-tree chipping of all live trees. The second measures stocking of only those trees considered desirable and acceptable by traditional markets and harvesting systems. We used both measures and made separate sets of tables for each for the equations based on STEMS and the equations based on Kittredge and Gevorkiantz (1929).

# RESULTS

The site productivity and percent of potential achieved were determined for each aspen plot and summarized for the State. Tables 4 through 23 in the Appendix include State and Unit totals for both growing-stock and all live trees based on the equations derived from STEMS. In addition, State totals based on Kittredge and Gevorkiantz (1929) are included (Appendix tables 24-27) to allow comparison of Minnesota's aspen type productivity with that of Wisconsin. The total acres within each age class are the same for all methods of computation, but the distribution of acres among achievement and potential productivity classes differs.

The following is an example of how the tables may be used in evaluating aspen productivity in Minnesota. If we define a low productivity area as one with a potential for growing less than 41 cubic feet per acre per year, then there are 321,700 acres of such "low productivity" stands (Appendix table 4) in the State out of a total of 5,377,200 acres. Or, low productivity could be considered as all stands with a site productivity less than 61 cubic feet per acre per year and all stands presently achieving less than 51 percent of potential based on growing-stock trees. In this case we could add all acres with a site potential less than 61 cubic feet per acre per year (321,700 + 2,314,400 = 2,636,100 acres) and those areas with a potential greater than 60 cubic feet per acre per year that are at 50 percent or less of potential (1,152,800 acres) to get a total low productivity area in Minnesota of 3,788,900 acres.

Maps showing the location of selected aspen plots in Minnesota were prepared using the Universal Transverse Mercator Grid Coordinates (UTM) for each plot. These maps provide a visual impression of plot locations and help identify areas that have a concentration of special categories of aspen plots. A map showing the location of all 3,522 aspen plots in Minnesota provides a visual standard for comparing all the other maps (fig. 2).

Plots with the lowest site productivity (MMAI less than 41 cubic feet per acre per year) are shown in figure 3. Timber production from these stands would be low even if full stocking were achieved. Worth noting is the lack of low site plots in large parts of Lake, Cass, and Itasca Counties. Kittson, Roseau, Marshall and western Beltrami Counties have a higher than average percent of low site plots.

The plots that achieve less than 26 percent of their potential based on growing-stock trees are fairly evenly distributed throughout the aspen type (fig. 4). Aspen production would be greatly increased if these stands were fully stocked.

Some plots with a high site productivity (greater than 80 cubic feet per acre per year) are achieving less than half of their potential based on growing stock trees (fig. 5). These plots would be prime candidates for some form of management. They are concentrated in the north-central part of the State, in and around Itasca County.

A fast way to increase productivity would be to harvest overmature aspen stands that have a high productive potential in order to regenerate an adequately stocked aspen stand. Such stands with age greater than 50 and MMAI greater than 80 are concentrated in Itasca and northern St. Louis Counties (fig. 6).

# DISCUSSION

When compared to previous systems and observed conditions, the STEMS potential basal area outlined in this paper appears to give consistent and reasonable results and provides greater flexibility for evaluation. Many plots closely approach their potential for the entire range of sites and ages. For example, 38 percent of the aspen plots in Minnesota had more than three-quarters of their STEMS potential basal area in all live trees. Seventeen percent of all the aspen plots had more than their potential basal area, if all live trees are included. Even if only growing-stock basal area is considered, 9 percent of all the

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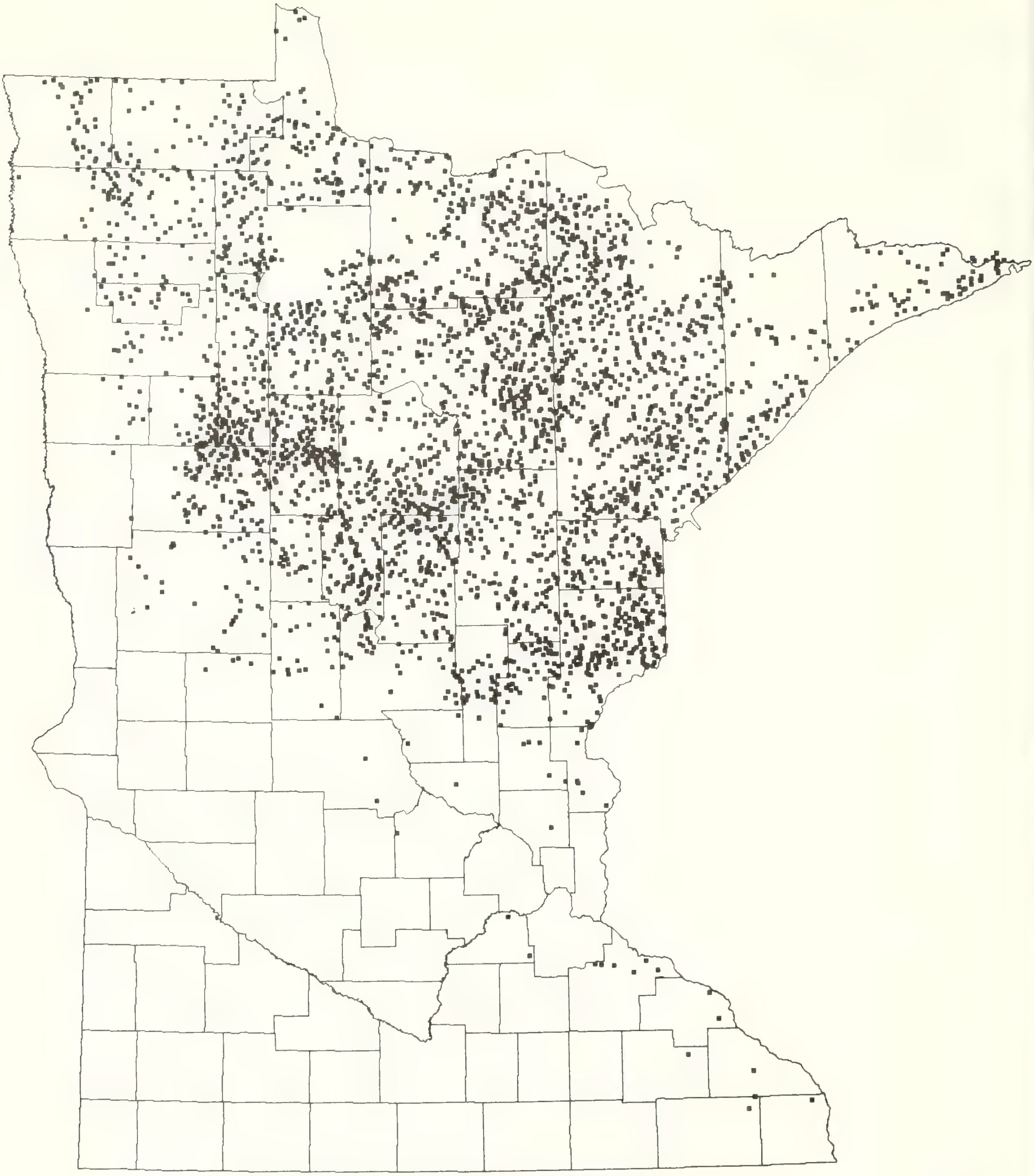

Figure 2.—*Location of all inventory plots typed as aspen.*

plots exceeded the potential indicated for their specific site and age. This strongly indicates that the potential basal areas used in this report are realistic goals.[2]

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[2] *The potential basal area equation developed by Lundgren and Hahn (1978) generally gives a lower basal area than the STEMS equation.*

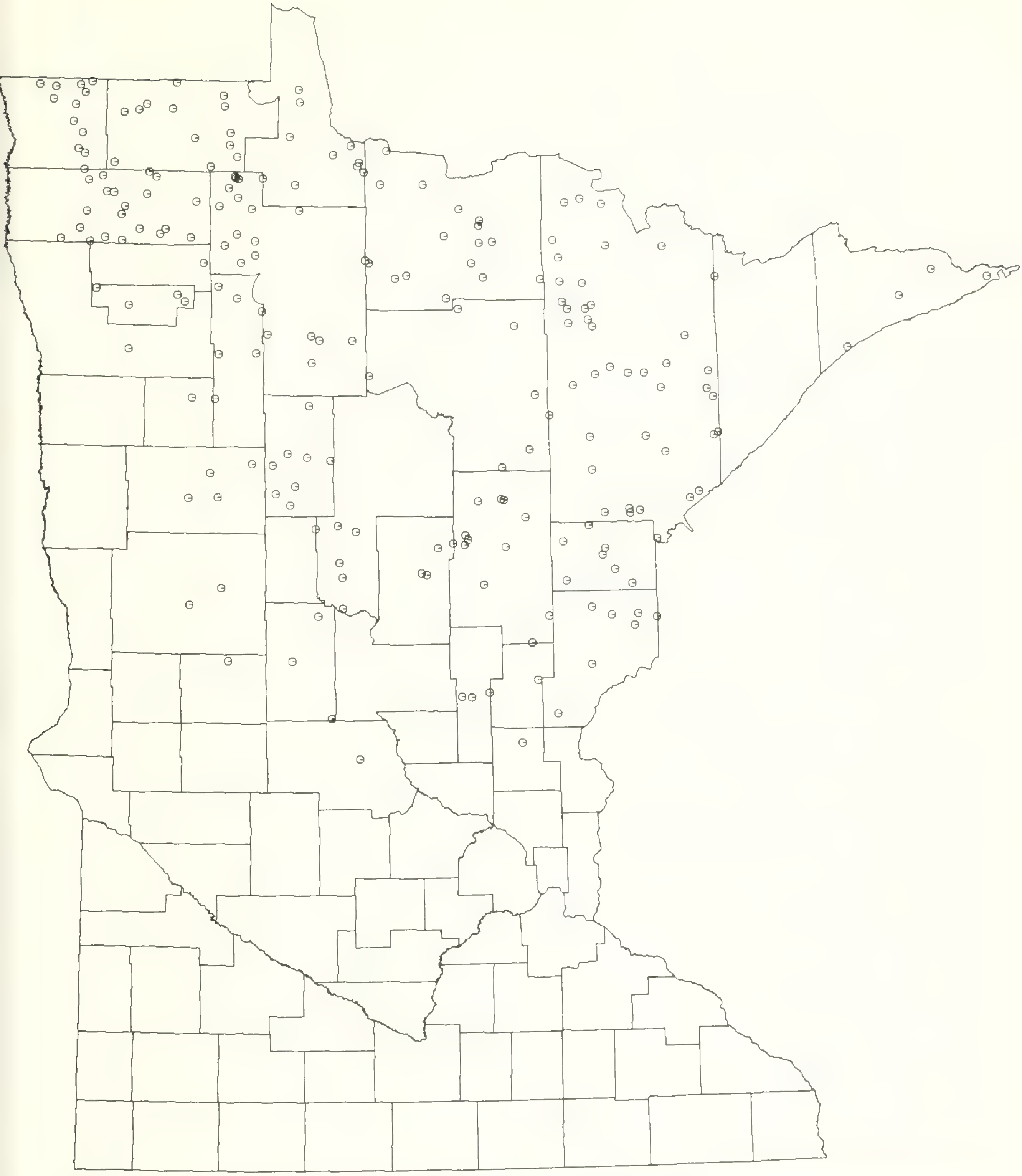

Figure 3.—*Location of aspen plots with a site productivity less than 41 cubic feet per acre per year.*

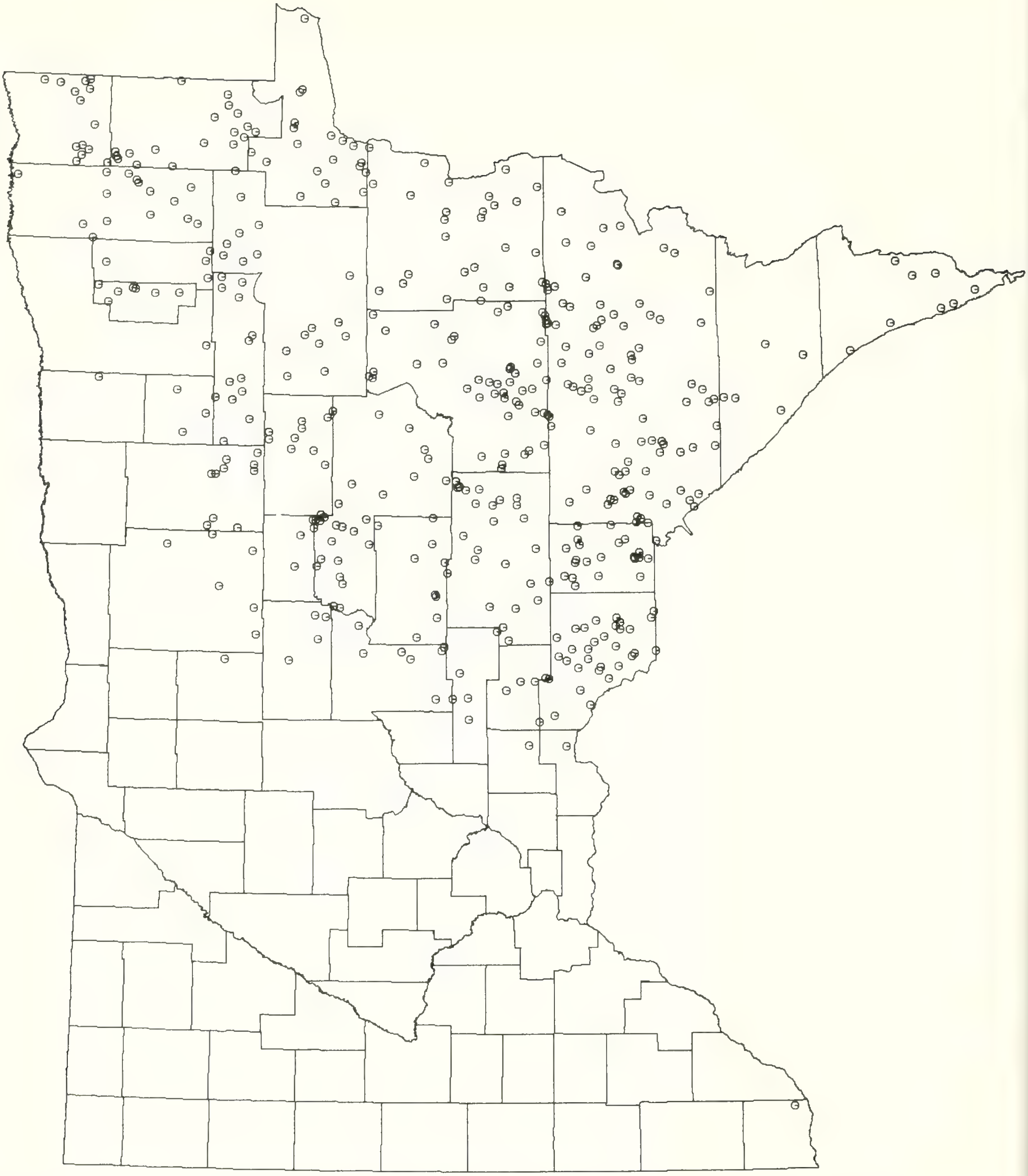

Figure 4.—*Location of aspen plots achieving less than 26 percent of STEMS growing stock potential.*

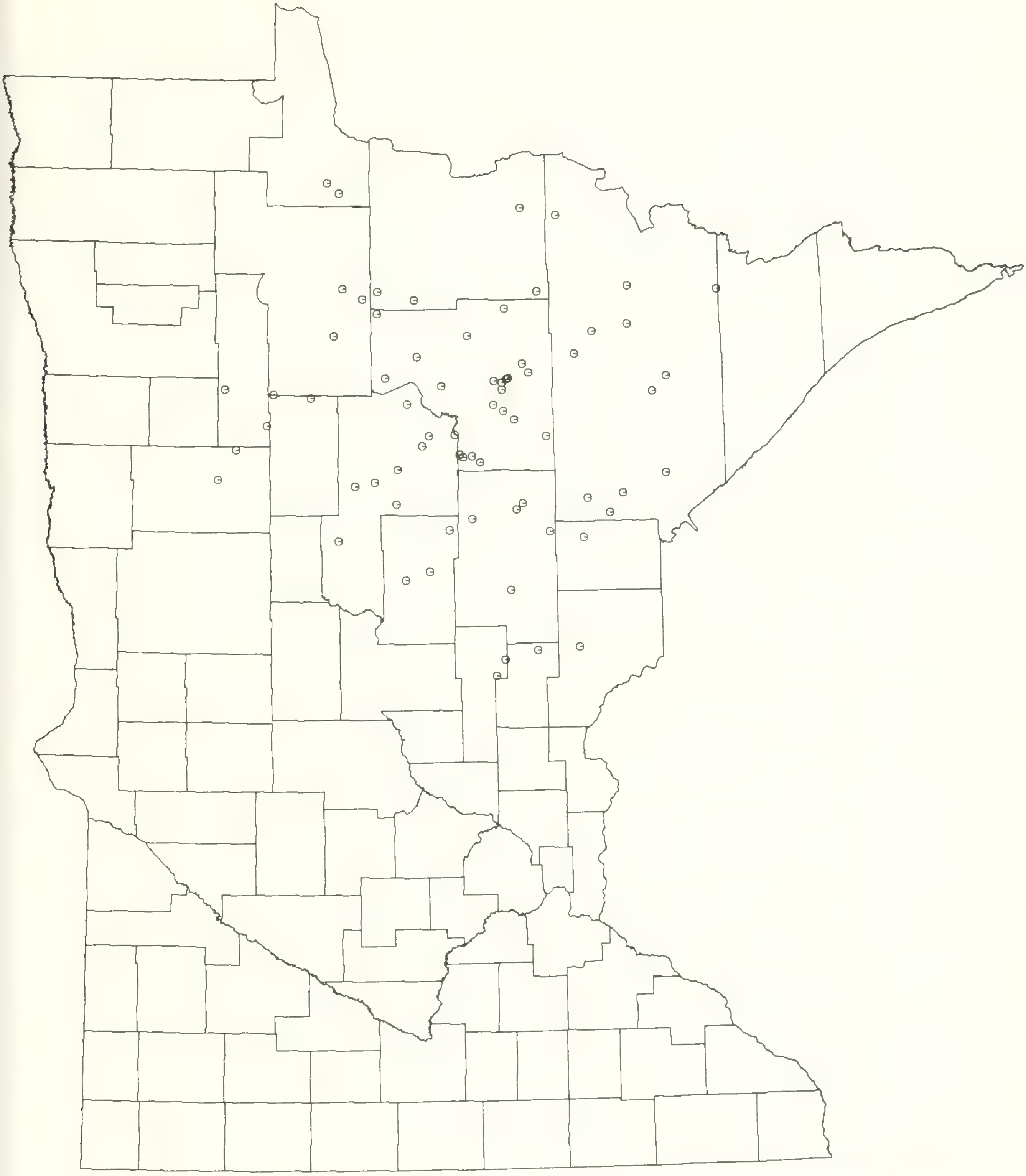

Figure 5.—*Location of aspen plots with a site productivity greater than 80 cubic feet per acre per year but achieving less than 51 percent of STEMS growing stock potential.*

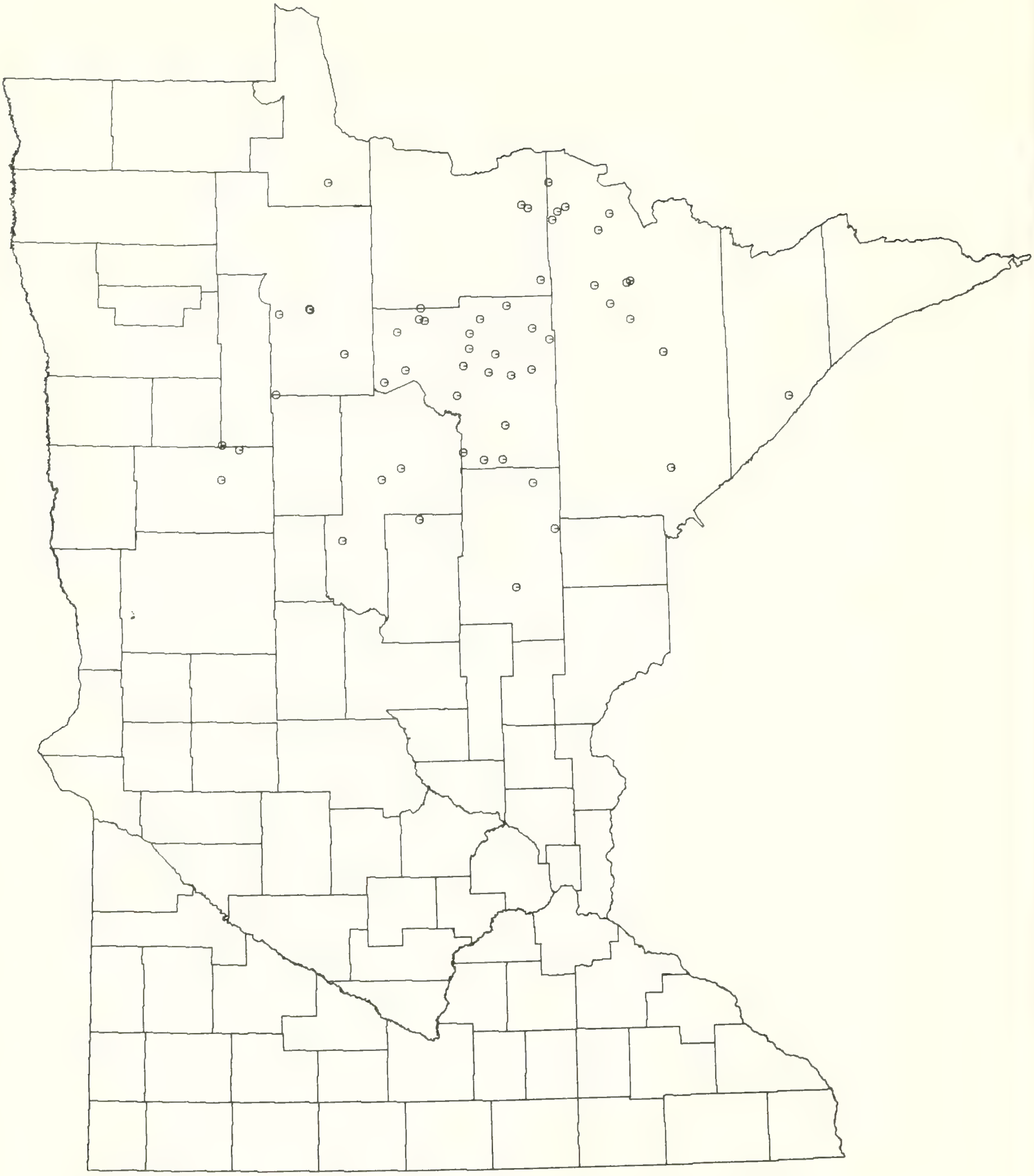

Figure 6.—*Location of aspen plots with a site productivity greater than 80 cubic feet per acre per year and a stand age greater than 50 years.*

In Minnesota, 2.6 million acres of aspen (49 percent of the total table 1) currently achieve less than half of their potential, if only growing-stock trees are considered. Even if all live trees are included, 1.5 million acres (29 percent of the aspen type) achieve less than half of their potential. Thus, the potential exists for greatly increasing yield of the aspen type in Minnesota.

If it were desirable and possible to reach full production in all of the aspen type, there could be an annual harvest of 120,100 acres containing a total of 325.6 million cubic feet.[3] The 1976 aspen growing-stock removals for products in Minnesota was 60.3 million cubic feet. This level of removals could be supported by maintaining full stocking on only the best 14.4 percent of aspen sites.

Attaining full stocking on all acres of aspen type is an unrealistic goal (Bruce 1977, Spurr and Vaux 1976). Insect and disease epidemics, windstorms, drought, and many other factors all contribute to understocking and make full stocking on every acre an unattainable goal. However, maintaining full stocking on the best 39 percent of the aspen land would produce as much volume as the entire aspen type currently produces. Research is needed to determine why large areas are understocked and to suggest measures that could be taken to improve stocking.

To achieve full site potential in poorly stocked aspen stands, the existing stand may have to be removed and the site regenerated by appropriate measures. But it may not be desirable to regenerate all sites to aspen—some sites may be better adapted to other species, or the cost of site preparation to ensure full stocking may exceed the benefit.

A summary of acres by physiographic class and site index for all aspen plots may give some clues about the potential for site conversion (tables 14 and 15). Five physiographic classes were used in the Minnesota inventory, ranging from xeric (very dry, droughty sites) through hydric (where growth and number of species are seriously limited by excess water).

Mesic sites constitute 85.4 percent of the aspen type. These sites have the highest average MMAI, 61.4 cubic feet per acre per year; hydric sites have the lowest average MMAI at 51.6 cubic feet per acre per year. The distribution of the aspen type by physiographic class is given in table 2. Tables in the Appendix break down the area of the aspen type by site potential, percent achieved, and physiographic class. These data indicate that mesic sites tend to have the highest potential and highest achievement of that potential.

Table 1.—*Potential basal area achieved by aspen commercial forest, by Survey Unit, Minnesota 1977*[1] *(based on STEMS)*

(In percent of commercial aspen area by Survey Unit)

| Survey unit | Potential achieved (percent) | | | | Total |
|---|---|---|---|---|---|
| | 0-25 | 26-50 | 51-75 | 76+ | 0-100+ |
| ALL LIVE TREES | | | | | |
| Aspen-birch | 6 | 24 | 33 | 37 | 100 |
| Northern pine | 6 | 19 | 35 | 40 | 100 |
| Central hardwood | 7 | 27 | 36 | 30 | 100 |
| Prairie | 8 | 24 | 28 | 40 | 100 |
| All units | 6 | 22 | 34 | 38 | 100 |
| GROWING-STOCK TREES | | | | | |
| Aspen-birch | 20 | 42 | 16 | 22 | 100 |
| Northern pine | 12 | 34 | 34 | 20 | 100 |
| Central hardwood | 16 | 45 | 24 | 15 | 100 |
| Prairie | 24 | 31 | 25 | 20 | 100 |
| All units | 13 | 36 | 30 | 21 | 100 |

[1] Includes data from Superior National Forest 1979 and Chippewa National Forest 1980.

Tables 24 through 27 in the Appendix are directly comparable with the tables produced by Lundgren and Hahn (1978) for Wisconsin. Table 3 shows how the distribution of the aspen type in Minnesota compares with that of Wisconsin. Based on growing-stock trees, Minnesota's aspen type is achieving more of its potential than Wisconsin's. In addition, a larger proportion of Minnesota's aspen sites have a higher productive potential than Wisconsin's.

Table 2.—*Physiographic class of aspen commercial forest, Minnesota 1977*[1]

(In percent of commercial aspen area by Survey Unit)

| Survey unit | Xeric | Xeromesic | Mesic | Hydromesic | Hydric | All |
|---|---|---|---|---|---|---|
| Aspen-birch | 0.8 | 2.0 | 81.1 | 15.7 | 0.4 | 100.0 |
| Northern pine | .1 | 1.5 | 87.7 | 10.2 | .5 | 100.0 |
| Central hardwood | .5 | .6 | 85.0 | 13.7 | .3 | 100.0 |
| Prairie | — | — | 96.1 | 3.8 | — | 100.0 |
| All units | .4 | 1.5 | 85.4 | 12.3 | .4 | 100.0 |

[1] Includes data from Superior National Forest 1979 and Chippewa National Forest 1980.

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[3] *These data are based on the STEMS simulation and assume (1) full area regulation of the aspen type, (2) no thinning, and (3) harvesting at the culmination of mean annual increment.*

Table 3.—*Potential basal area achieved by aspen commercial forest by site productivity class, Minnesota 1977 and Wisconsin 1968 (based on Kittredge and Gevorkiantz 1929)*[1]

(In percent of total commercial aspen area)

| Site productivity (ft$^3$/ac/yr) | Potential achieved (percent) | | | | | | | | Total 0-100+ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0-25 | | 26-50 | | 51-75 | | 76+ | | | |
| | MN | WI | MN | WI | MN | WI | MN | WI | MN | WI |
| 101-120 | — | — | | 2 | 2 | 1 | 1 | 1 | 5 | 3 |
| 81-100 | 2 | 5 | 13 | 10 | 13 | 10 | 8 | 10 | 36 | 35 |
| 61-80 | 3 | 5 | 11 | 10 | 11 | 10 | 12 | 10 | 38 | 35 |
| 41-60 | 2 | 5 | 4 | 6 | 4 | 5 | 5 | 5 | 15 | 21 |
| 21-40 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 6 | 6 |
| All sites | 9 | 18 | 31 | 28 | 32 | 26 | 28 | 27 | 100 | 100 |

[1] Includes data from Superior National Forest 1979 and Chippewa National Forest 1980. Wisconsin data is from Lundgren and Hahn (1978).

# CONCLUSIONS

Much forest area classified as aspen type in Minnesota can produce high cubic foot volumes but is currently achieving less than its potential. The 1976 aspen growing-stock removals for products could be grown on the best 14.4 percent of the State's aspen sites. The best aspen sites that are seriously underachieving their potential are located in north central Minnesota in and around Itasca County. Because 55 percent of these sites are in public ownership, research is needed on the possibilities and techniques for reaching full stocking in aspen stands. Whether full productivity is economically, ecologically, or environmentally feasible also must be determined.

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# APPENDIX

## DEFINITION OF TERMS

**Acceptable trees.**—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commerical forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.)

**Desirable trees.**—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide.) Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

**Forest type.**—A classification of forest land based upon the species forming a plurality of live tree stocking.

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by multiplying by 79 cubic feet per solid wood cord.

**Land area.**—A. *Bureau of the Census.* The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Survey.* The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Live trees.**—Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

**National forest land.**—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area to qualify as nonforest land.)

a. *Nonforest land without trees.—Nonforest* land with no live trees present.

b. *Nonforest land with trees.—Nonforest* land with one or more trees at least 5 inches d.b.h. per acre.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Resources Evaluation inventories are:

*Xeric sites.—Very* dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.—Moderately* dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.—Deep,* well-drained soils. Growth and species occurrence are limited only by climate.

*Hydromesic sites.—Moderately* wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

*Hydric sites.—Very* wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administration regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten trees.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough trees.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Site class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

Table 4.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for growing-stock trees, based on STEMS, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | 5.4 | -- | -- | 1.3 | -- | 1.3 | 1.4 | -- | 1.4 |
| | 51-75 | 9.5 | 1.4 | -- | -- | -- | 2.8 | 3.9 | 1.4 | -- |
| | 76+ | 6.8 | -- | -- | 2.8 | 2.7 | -- | 1.3 | -- | -- |
| | Total | 21.7 | 1.4 | -- | 4.1 | 2.7 | 4.1 | 6.6 | 1.4 | 1.4 |
| 81-100 | 0-25 | 13.9 | 1.4 | 3.3 | 1.3 | 2.7 | 1.2 | 4.0 | -- | -- |
| | 26-50 | 87.3 | 1.2 | 2.7 | 16.2 | 17.3 | 25.8 | 11.8 | 9.6 | 2.7 |
| | 51-75 | 149.5 | 2.7 | 7.0 | 13.9 | 51.9 | 39.2 | 22.7 | 1.3 | 10.8 |
| | 76+ | 110.5 | 14.9 | 4.4 | 20.2 | 24.8 | 24.4 | 9.6 | 2.7 | 9.5 |
| | Total | 361.2 | 20.2 | 17.4 | 51.6 | 96.7 | 90.6 | 48.1 | 13.6 | 23.0 |
| 61-80 | 0-25 | 179.2 | 42.7 | 23.1 | 16.7 | 24.8 | 35.0 | 22.9 | 7.5 | 6.6 |
| | 26-50 | 867.0 | 34.5 | 49.6 | 85.1 | 193.3 | 240.2 | 183.7 | 43.7 | 37.0 |
| | 51-75 | 799.3 | 21.6 | 51.1 | 60.7 | 158.1 | 244.5 | 172.8 | 65.5 | 25.0 |
| | 76+ | 512.7 | 165.8 | 54.1 | 32.7 | 75.0 | 87.8 | 66.3 | 17.4 | 13.8 |
| | Total | 2,358.2 | 264.6 | 177.9 | 195.1 | 451.2 | 607.5 | 445.6 | 134.0 | 82.4 |
| 41-60 | 0-25 | 408.5 | 110.0 | 64.4 | 50.8 | 51.0 | 45.4 | 56.8 | 16.5 | 13.7 |
| | 26-50 | 835.4 | 51.1 | 71.9 | 65.9 | 98.1 | 197.5 | 190.3 | 87.2 | 73.4 |
| | 51-75 | 599.3 | 67.5 | 83.6 | 38.2 | 70.3 | 131.7 | 124.2 | 53.7 | 30.2 |
| | 76+ | 471.1 | 180.0 | 65.3 | 9.8 | 30.3 | 49.6 | 64.8 | 38.0 | 33.3 |
| | Total | 2,314.4 | 408.5 | 285.1 | 164.7 | 249.8 | 424.3 | 436.1 | 195.4 | 150.6 |
| 21-40 | 0-25 | 96.7 | 23.8 | 25.2 | 12.1 | 14.4 | 7.2 | 9.9 | 1.3 | 2.8 |
| | 26-50 | 115.4 | 9.3 | 12.4 | 9.0 | 3.0 | 12.1 | 23.3 | 29.9 | 16.5 |
| | 51-75 | 62.9 | 7.6 | 14.1 | 4.2 | 5.7 | 14.5 | 8.4 | 2.8 | 5.5 |
| | 76+ | 46.7 | 21.1 | 14.1 | -- | 1.7 | 5.4 | 1.4 | 3.0 | -- |
| | Total | 321.7 | 61.9 | 65.8 | 25.3 | 24.8 | 39.1 | 43.0 | 37.0 | 24.8 |
| Total | 0-25 | 698.4 | 177.9 | 115.9 | 80.9 | 92.9 | 88.7 | 93.6 | 25.3 | 23.1 |
| | 26-50 | 1,910.4 | 96.1 | 136.6 | 177.5 | 311.8 | 476.8 | 410.4 | 170.3 | 130.9 |
| | 51-75 | 1,620.6 | 100.9 | 155.9 | 117.0 | 286.0 | 432.8 | 332.0 | 124.7 | 71.5 |
| | 76+ | 1,147.8 | 381.7 | 137.9 | 65.4 | 134.5 | 167.2 | 143.4 | 61.1 | 56.6 |
| | Total | 5,377.2 | 756.5 | 546.3 | 440.8 | 825.2 | 1,165.5 | 979.4 | 381.4 | 282.1 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

Table 5.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for all live trees, based on STEMS, Minnesota, 1977[1]

| Site productivity (ft$^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | 6.5 | -- | -- | 1.3 | -- | 1.3 | 2.5 | -- | 1.4 |
| | 76+ | 15.2 | 1.4 | -- | 2.8 | 2.7 | 2.8 | 4.1 | 1.4 | -- |
| | Total | 21.7 | 1.4 | -- | 4.1 | 2.7 | 4.1 | 6.6 | 1.4 | 1.4 |
| 81-100 | 0-25 | 6.0 | -- | 3.3 | 1.3 | -- | -- | 1.4 | -- | -- |
| | 26-50 | 40.6 | 1.4 | -- | 6.0 | 12.9 | 16.2 | 2.7 | 1.4 | -- |
| | 51-75 | 106.3 | 1.3 | 4.1 | 14.7 | 32.1 | 23.1 | 17.5 | 8.2 | 5.3 |
| | 76+ | 208.3 | 17.5 | 10.0 | 29.6 | 51.7 | 51.3 | 26.5 | 4.0 | 17.7 |
| | Total | 361.2 | 20.2 | 17.4 | 51.6 | 96.7 | 90.6 | 48.1 | 13.6 | 23.0 |
| 61-80 | 0-25 | 89.9 | 38.7 | 9.7 | 9.6 | 12.2 | 11.4 | 5.2 | 1.4 | 1.7 |
| | 26-50 | 477.0 | 20.4 | 36.8 | 40.6 | 109.3 | 119.2 | 112.9 | 22.7 | 15.1 |
| | 51-75 | 856.7 | 10.0 | 48.7 | 73.8 | 181.3 | 257.0 | 188.2 | 60.0 | 37.6 |
| | 76+ | 934.7 | 195.4 | 82.8 | 71.0 | 148.4 | 219.9 | 139.3 | 50.0 | 28.0 |
| | Total | 2,358.2 | 264.6 | 177.9 | 195.1 | 451.2 | 607.5 | 445.6 | 134.0 | 82.4 |
| 41-60 | 0-25 | 198.3 | 79.8 | 34.4 | 23.2 | 21.5 | 11.3 | 19.9 | 4.0 | 4.3 |
| | 26-50 | 581.6 | 41.4 | 48.4 | 70.5 | 79.9 | 138.0 | 122.2 | 49.5 | 31.7 |
| | 51-75 | 748.6 | 44.3 | 98.6 | 51.1 | 82.6 | 163.8 | 168.7 | 74.3 | 65.2 |
| | 76+ | 786.0 | 243.0 | 103.8 | 19.9 | 65.8 | 111.1 | 125.3 | 67.6 | 49.4 |
| | Total | 2,314.4 | 408.5 | 285.1 | 164.7 | 249.8 | 424.3 | 436.1 | 195.4 | 150.6 |
| 21-40 | 0-25 | 47.6 | 16.1 | 11.9 | 6.4 | 5.9 | 3.1 | 3.0 | -- | 1.3 |
| | 26-50 | 95.7 | 3.4 | 17.3 | 10.1 | 10.1 | 12.0 | 23.2 | 10.8 | 8.8 |
| | 51-75 | 95.3 | 10.6 | 13.8 | 5.8 | 4.2 | 13.3 | 12.5 | 21.8 | 13.3 |
| | 76+ | 83.1 | 31.7 | 22.9 | 3.0 | 4.6 | 10.7 | 4.4 | 4.4 | 1.4 |
| | Total | 321.7 | 61.9 | 65.8 | 25.3 | 24.8 | 39.1 | 43.0 | 37.0 | 24.8 |
| Total | 0-25 | 341.8 | 134.5 | 59.2 | 40.5 | 39.6 | 25.9 | 29.5 | 5.3 | 7.3 |
| | 26-50 | 1,194.8 | 66.7 | 102.6 | 127.2 | 212.1 | 285.4 | 260.9 | 84.3 | 55.6 |
| | 51-75 | 1,813.4 | 66.3 | 165.1 | 146.8 | 300.2 | 458.5 | 389.4 | 164.3 | 122.8 |
| | 76+ | 2,027.3 | 489.0 | 219.4 | 126.3 | 273.2 | 395.8 | 299.6 | 127.4 | 96.5 |
| | Total | 5,377.2 | 756.5 | 546.3 | 440.8 | 825.2 | 1,165.5 | 979.4 | 381.4 | 282.1 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

Table 6.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for growing-stock trees, based on STEMS, Minnesota, 1977[1]

| Site productivity (ft$^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | 5.4 | -- | -- | 4.1 | 1.3 | -- |
| | 51-75 | 9.5 | -- | -- | 9.5 | -- | -- |
| | 76+ | 6.8 | -- | -- | 6.8 | -- | -- |
| | Total | 21.7 | -- | -- | 20.4 | 1.3 | -- |
| 81-100 | 0-25 | 13.9 | -- | -- | 8.7 | 5.2 | -- |
| | 26-50 | 87.3 | -- | -- | 74.5 | 12.8 | -- |
| | 51-75 | 149.5 | -- | 1.4 | 141.2 | 6.9 | -- |
| | 76+ | 110.5 | -- | -- | 99.8 | 10.7 | -- |
| | Total | 361.2 | -- | 1.4 | 324.2 | 35.6 | -- |
| 61-80 | 0-25 | 179.2 | -- | 2.5 | 145.1 | 30.0 | 1.7 |
| | 26-50 | 867.0 | 2.1 | 11.9 | 744.7 | 102.6 | 5.7 |
| | 51-75 | 799.3 | 1.4 | 9.7 | 719.2 | 69.0 | -- |
| | 76+ | 512.7 | 1.5 | 1.4 | 467.8 | 42.0 | -- |
| | Total | 2,358.2 | 5.0 | 25.5 | 2,076.8 | 243.6 | 7.4 |
| 41-60 | 0-25 | 408.5 | 13.8 | 8.8 | 312.5 | 73.5 | -- |
| | 26-50 | 835.4 | 1.4 | 10.6 | 697.0 | 122.0 | 4.5 |
| | 51-75 | 599.3 | 1.4 | 9.6 | 513.8 | 73.3 | 1.3 |
| | 76+ | 471.1 | -- | 12.9 | 413.7 | 42.8 | 1.7 |
| | Total | 2,314.4 | 16.6 | 41.8 | 1,937.0 | 311.5 | 7.5 |
| 21-40 | 0-25 | 96.7 | -- | 3.9 | 61.0 | 25.8 | 6.0 |
| | 26-50 | 115.4 | 1.4 | 4.2 | 88.0 | 21.8 | -- |
| | 51-75 | 62.9 | -- | -- | 53.8 | 7.4 | 1.7 |
| | 76+ | 46.7 | -- | 3.0 | 31.2 | 12.5 | -- |
| | Total | 321.7 | 1.4 | 11.1 | 233.9 | 67.6 | 7.7 |
| Total | 0-25 | 698.4 | 13.8 | 15.2 | 527.3 | 134.4 | 7.7 |
| | 26-50 | 1,910.4 | 4.9 | 26.7 | 1,608.2 | 260.5 | 10.2 |
| | 51-75 | 1,620.6 | 2.7 | 20.7 | 1,437.5 | 156.6 | 3.0 |
| | 76+ | 1,147.8 | 1.5 | 17.3 | 1,019.3 | 108.0 | 1.7 |
| | Total | 5,377.2 | 22.9 | 79.8 | 4,592.3 | 659.5 | 22.6 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

Table 7.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for all live trees, based on STEMS, Minnesota, 1977[1]

| Site productivity (ft³/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | 6.5 | -- | -- | 5.2 | 1.3 | -- |
| | 76+ | 15.2 | -- | -- | 15.2 | -- | -- |
| | Total | 21.7 | -- | -- | 20.4 | 1.3 | -- |
| 81-100 | 0-25 | 6.0 | -- | -- | 4.7 | 1.3 | -- |
| | 26-50 | 40.6 | -- | -- | 33.6 | 7.0 | -- |
| | 51-75 | 106.3 | -- | 1.4 | 92.3 | 12.6 | -- |
| | 76+ | 208.3 | -- | -- | 193.6 | 14.7 | -- |
| | Total | 361.2 | -- | 1.4 | 324.2 | 35.6 | -- |
| 61-80 | 0-25 | 89.9 | -- | 1.1 | 73.1 | 15.7 | -- |
| | 26-50 | 477.0 | -- | 10.3 | 392.2 | 68.7 | 5.8 |
| | 51-75 | 856.7 | 3.5 | 7.1 | 752.4 | 92.0 | 1.6 |
| | 76+ | 934.7 | 1.5 | 7.0 | 859.1 | 67.2 | -- |
| | Total | 2,358.2 | 5.0 | 25.5 | 2,076.8 | 243.6 | 7.4 |
| 41-60 | 0-25 | 198.3 | -- | 5.8 | 160.5 | 32.0 | -- |
| | 26-50 | 581.6 | 15.2 | 13.2 | 463.3 | 88.4 | 1.6 |
| | 51-75 | 748.6 | -- | 7.2 | 628.5 | 108.7 | 4.2 |
| | 76+ | 786.0 | 1.4 | 15.7 | 684.7 | 82.5 | 1.7 |
| | Total | 2,314.4 | 16.6 | 41.8 | 1,937.0 | 311.5 | 7.5 |
| 21-40 | 0-25 | 47.6 | -- | 2.6 | 25.1 | 17.0 | 3.0 |
| | 26-50 | 95.7 | 1.4 | 4.2 | 72.9 | 15.5 | 1.7 |
| | 51-75 | 95.3 | -- | -- | 77.3 | 15.0 | 3.0 |
| | 76+ | 83.1 | -- | 4.3 | 58.6 | 20.1 | -- |
| | Total | 321.7 | 1.4 | 11.1 | 233.9 | 67.6 | 7.7 |
| Total | 0-25 | 341.8 | -- | 9.5 | 263.4 | 65.9 | 3.0 |
| | 26-50 | 1,194.8 | 16.6 | 27.7 | 961.9 | 179.5 | 9.1 |
| | 51-75 | 1,813.4 | 3.5 | 15.7 | 1,555.8 | 229.6 | 8.8 |
| | 76+ | 2,027.3 | 2.9 | 27.0 | 1,811.2 | 184.5 | 1.7 |
| | Total | 5,377.2 | 22.9 | 79.8 | 4,592.3 | 659.5 | 22.6 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

Table 8.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for growing-stock trees, based on STEMS, Aspen-Birch Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | 1.4 | -- | -- | -- | -- | -- | -- | -- | .1 |
| | 51-75 | 4.2 | 1.4 | -- | -- | -- | 2.8 | -- | -- | -- |
| | 76+ | 2.7 | -- | -- | -- | 2.7 | -- | -- | -- | -- |
| | Total | 8.3 | 1.4 | -- | -- | 2.7 | 2.8 | -- | -- | .1 |
| 81-100 | 0-25 | 2.8 | 1.4 | -- | -- | -- | -- | 1.4 | -- | -- |
| | 26-50 | 20.3 | -- | -- | 3.1 | 7.4 | 5.6 | 1.4 | 2.8 | -- |
| | 51-75 | 43.1 | -- | 4.2 | 4.3 | 13.7 | 12.4 | 5.9 | -- | 2.6 |
| | 76+ | 38.8 | 7.2 | 2.8 | 7.0 | 3.9 | 8.2 | 5.6 | 1.4 | 2.7 |
| | Total | 105.0 | 8.6 | 7.0 | 14.4 | 25.0 | 26.2 | 14.3 | 4.2 | 5.3 |
| 61-80 | 0-25 | 52.9 | 10.0 | 4.6 | 9.0 | 8.5 | 12.3 | 7.0 | 1.5 | -- |
| | 26-50 | 294.6 | 14.4 | 15.0 | 39.1 | 60.8 | 79.2 | 61.8 | 16.2 | 8.1 |
| | 51-75 | 256.0 | 6.1 | 14.1 | 19.4 | 47.5 | 71.8 | 68.7 | 21.9 | 6.5 |
| | 76+ | 178.0 | 64.0 | 15.4 | 8.6 | 21.0 | 29.3 | 26.3 | 5.5 | 7.9 |
| | Total | 781.5 | 94.5 | 49.1 | 76.1 | 137.8 | 192.6 | 163.8 | 45.1 | 22.5 |
| 41-60 | 0-25 | 160.8 | 35.9 | 21.1 | 27.7 | 18.4 | 19.8 | 28.2 | 1.4 | 8.3 |
| | 26-50 | 329.9 | 21.7 | 29.2 | 16.5 | 28.6 | 74.3 | 83.0 | 35.8 | 40.8 |
| | 51-75 | 222.8 | 28.8 | 30.2 | 16.7 | 17.4 | 31.5 | 57.3 | 21.9 | 19.0 |
| | 76+ | 244.1 | 76.4 | 26.4 | 4.3 | 13.9 | 36.9 | 45.9 | 22.1 | 18.2 |
| | Total | 957.6 | 162.8 | 106.9 | 65.2 | 78.3 | 162.5 | 214.4 | 81.2 | 86.3 |
| 21-40 | 0-25 | 22.8 | 4.0 | 1.4 | 7.6 | 4.2 | -- | 4.1 | -- | 1.5 |
| | 26-50 | 46.6 | 1.0 | 5.6 | 2.8 | -- | 5.4 | 10.0 | 16.3 | 5.5 |
| | 51-75 | 18.1 | -- | 4.1 | 4.2 | 3.1 | 2.6 | 4.1 | -- | -- |
| | 76+ | 24.7 | 8.4 | 9.5 | -- | -- | 5.4 | -- | 1.4 | -- |
| | Total | 112.2 | 13.4 | 20.6 | 14.6 | 7.3 | 13.4 | 18.2 | 17.7 | 7.0 |
| Total | 0-25 | 239.3 | 51.3 | 27.1 | 44.3 | 31.1 | 32.1 | 40.7 | 2.9 | 9.8 |
| | 26-50 | 692.8 | 37.1 | 49.8 | 61.5 | 96.8 | 164.5 | 156.2 | 71.1 | 55.8 |
| | 51-75 | 544.2 | 36.3 | 52.6 | 44.6 | 81.7 | 121.1 | 136.0 | 43.8 | 28.1 |
| | 76+ | 488.3 | 156.0 | 54.1 | 19.9 | 41.5 | 79.8 | 77.8 | 30.4 | 28.8 |
| | Total | 1,964.6 | 280.7 | 183.6 | 170.3 | 251.1 | 397.5 | 410.7 | 148.2 | 122.5 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 for the Superior National Forest.

Table 9.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for all live trees, based on STEMS, Aspen-Birch Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | 1.4 | -- | -- | -- | -- | -- | -- | -- | 1.4 |
| | 76+ | 6.9 | 1.4 | -- | -- | 2.7 | 2.8 | -- | -- | -- |
| | Total | 8.3 | 1.4 | -- | -- | 2.7 | 2.8 | -- | -- | 1.4 |
| 81-100 | 0-25 | 1.4 | -- | -- | -- | -- | -- | 1.4 | -- | -- |
| | 26-50 | 11.6 | 1.4 | -- | -- | 6.0 | 2.8 | -- | 1.4 | -- |
| | 51-75 | 32.7 | -- | 1.4 | 5.9 | 8.4 | 8.5 | 4.5 | 1.4 | 2.6 |
| | 76+ | 59.3 | 7.2 | 5.6 | 8.5 | 10.6 | 14.9 | 8.4 | 1.4 | 2.7 |
| | Total | 105.0 | 8.6 | 7.0 | 14.4 | 25.0 | 26.2 | 14.3 | 4.2 | 5.3 |
| 61-80 | 0-25 | 27.5 | 8.7 | 1.4 | 4.7 | 4.2 | 5.7 | 2.8 | -- | -- |
| | 26-50 | 194.5 | 8.4 | 12.4 | 18.2 | 46.6 | 47.0 | 49.5 | 9.6 | 2.8 |
| | 51-75 | 277.5 | 2.9 | 11.6 | 39.0 | 51.0 | 77.5 | 74.0 | 13.6 | 7.9 |
| | 76+ | 282.0 | 74.5 | 23.7 | 14.2 | 36.0 | 62.4 | 37.5 | 21.9 | 11.8 |
| | Total | 781.5 | 94.5 | 49.1 | 76.1 | 137.8 | 192.6 | 163.8 | 45.1 | 22.5 |
| 41-60 | 0-25 | 82.8 | 28.6 | 11.2 | 13.6 | 8.5 | 7.4 | 10.5 | -- | 3.0 |
| | 26-50 | 236.8 | 16.7 | 18.7 | 27.5 | 27.2 | 61.9 | 55.4 | 19.7 | 9.7 |
| | 51-75 | 288.7 | 19.4 | 34.9 | 17.0 | 17.6 | 42.9 | 86.3 | 29.9 | 40.7 |
| | 76+ | 349.3 | 98.1 | 42.1 | 7.1 | 25.0 | 50.3 | 62.2 | 31.6 | 32.9 |
| | Total | 957.6 | 162.8 | 106.9 | 65.2 | 78.3 | 162.5 | 214.4 | 81.2 | 86.3 |
| 21-40 | 0-25 | 8.6 | 2.7 | -- | 3.2 | 1.4 | -- | 1.3 | -- | -- |
| | 26-50 | 32.5 | -- | 4.3 | 5.8 | 1.4 | 4.0 | 8.5 | 2.8 | 5.7 |
| | 51-75 | 37.9 | 2.3 | 4.0 | 4.2 | 2.8 | 1.4 | 8.4 | 13.5 | 1.3 |
| | 76+ | 33.2 | 8.4 | 12.3 | 1.4 | 1.7 | 8.0 | -- | 1.4 | -- |
| | Total | 112.2 | 13.4 | 20.6 | 14.6 | 7.3 | 13.4 | 18.2 | 17.7 | 7.0 |
| Total | 0-25 | 120.3 | 40.0 | 12.6 | 21.5 | 14.1 | 13.1 | 16.0 | -- | 3.0 |
| | 26-50 | 475.4 | 26.5 | 35.4 | 51.5 | 81.2 | 115.7 | 113.4 | 33.5 | 18.2 |
| | 51-75 | 638.2 | 24.6 | 51.9 | 66.1 | 79.8 | 130.3 | 173.2 | 58.4 | 53.9 |
| | 76+ | 730.7 | 189.6 | 83.7 | 31.2 | 76.0 | 138.4 | 108.1 | 56.3 | 47.4 |
| | Total | 1,964.6 | 280.7 | 183.6 | 170.3 | 251.1 | 397.5 | 410.7 | 148.2 | 122.5 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 for the Superior National Forest.

Table 10.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for growing-stock trees, based on STEMS, Aspen-Birch Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | 1.4 | -- | -- | 1.4 | -- | -- |
| | 51-75 | 4.2 | -- | -- | 4.2 | -- | -- |
| | 76+ | 2.7 | -- | -- | 2.7 | -- | -- |
| | Total | 8.3 | -- | -- | 8.3 | -- | -- |
| 81-100 | 0-25 | 2.8 | -- | -- | 1.4 | 1.4 | -- |
| | 26-50 | 20.3 | -- | -- | 17.2 | 3.1 | -- |
| | 51-75 | 43.1 | -- | 1.4 | 41.7 | -- | -- |
| | 76+ | 38.8 | -- | -- | 34.7 | 4.1 | -- |
| | Total | 105.0 | -- | 1.4 | 95.0 | 8.6 | -- |
| 61-80 | 0-25 | 52.9 | -- | -- | 43.1 | 9.8 | -- |
| | 26-50 | 294.6 | -- | 5.8 | 232.7 | 52.9 | 3.2 |
| | 51-75 | 256.0 | -- | 4.3 | 211.4 | 40.3 | -- |
| | 76+ | 178.0 | 1.5 | 1.4 | 147.2 | 27.9 | -- |
| | Total | 781.5 | 1.5 | 11.5 | 634.4 | 130.9 | 3.2 |
| 41-60 | 0-25 | 160.8 | 13.8 | 3.2 | 117.6 | 26.2 | -- |
| | 26-50 | 329.9 | -- | 3.1 | 257.9 | 68.9 | -- |
| | 51-75 | 222.8 | -- | 6.9 | 185.5 | 30.4 | -- |
| | 76+ | 244.1 | -- | 8.1 | 214.6 | 21.4 | -- |
| | Total | 957.6 | 13.8 | 21.3 | 775.6 | 146.9 | -- |
| 21-40 | 0-25 | 22.8 | -- | -- | 15.4 | 3.1 | 4.3 |
| | 26-50 | 46.6 | 1.4 | 1.4 | 35.3 | 8.5 | -- |
| | 51-75 | 18.1 | -- | -- | 16.7 | 1.4 | -- |
| | 76+ | 24.7 | -- | 3.0 | 13.5 | 8.2 | -- |
| | Total | 112.2 | 1.4 | 4.4 | 80.9 | 21.2 | 4.3 |
| Total | 0-25 | 239.3 | 13.8 | 3.2 | 177.5 | 40.5 | 4.3 |
| | 26-50 | 692.8 | 1.4 | 10.3 | 544.5 | 133.4 | 3.2 |
| | 51-75 | 544.2 | -- | 12.6 | 459.5 | 72.1 | -- |
| | 76+ | 488.3 | 1.5 | 12.5 | 412.7 | 61.6 | -- |
| | Total | 1,964.6 | 16.7 | 38.6 | 1,594.2 | 307.6 | 7.5 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 for the Superior National Forest.

Table 11.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for all live trees, based on STEMS, Aspen-Birch Unit, Minnesota, 1977[1/]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | 1.4 | -- | -- | 1.4 | -- | -- |
| | 76+ | 6.9 | -- | -- | 6.9 | -- | -- |
| | Total | 8.3 | -- | -- | 8.3 | -- | -- |
| 81-100 | 0-25 | 1.4 | -- | -- | 1.4 | -- | -- |
| | 26-50 | 11.6 | -- | -- | 7.1 | 4.5 | -- |
| | 51-75 | 32.7 | -- | 1.4 | 31.3 | -- | -- |
| | 76+ | 59.3 | -- | -- | 55.2 | 4.1 | -- |
| | Total | 105.0 | -- | 1.4 | 95.0 | 8.6 | -- |
| 61-80 | 0-25 | 27.5 | -- | -- | 23.3 | 4.2 | -- |
| | 26-50 | 194.5 | -- | 4.4 | 143.1 | 45.4 | 1.6 |
| | 51-75 | 277.5 | -- | 2.8 | 226.9 | 46.2 | 1.6 |
| | 76+ | 282.0 | 1.5 | 4.3 | 241.1 | 35.1 | -- |
| | Total | 781.5 | 1.5 | 11.5 | 634.4 | 130.9 | 3.2 |
| 41-60 | 0-25 | 82.8 | -- | 1.6 | 70.7 | 10.5 | -- |
| | 26-50 | 236.8 | 13.8 | 4.4 | 175.6 | 43.0 | -- |
| | 51-75 | 288.7 | -- | 4.4 | 227.6 | 56.7 | -- |
| | 76+ | 349.3 | -- | 10.9 | 301.7 | 36.7 | -- |
| | Total | 957.6 | 13.8 | 21.3 | 775.6 | 146.9 | -- |
| 21-40 | 0-25 | 8.6 | -- | -- | 4.0 | 1.6 | 3.0 |
| | 26-50 | 32.5 | 1.4 | 1.4 | 23.9 | 5.8 | -- |
| | 51-75 | 37.9 | -- | -- | 31.0 | 5.6 | 1.3 |
| | 76+ | 33.2 | -- | 3.0 | 22.0 | 8.2 | -- |
| | Total | 112.2 | 1.4 | 4.4 | 80.9 | 21.2 | 4.3 |
| Total | 0-25 | 120.3 | -- | 1.6 | 99.4 | 16.3 | 3.0 |
| | 26-50 | 475.4 | 15.2 | 10.2 | 349.7 | 98.7 | 1.6 |
| | 51-75 | 638.2 | -- | 8.6 | 518.2 | 108.5 | 2.9 |
| | 76+ | 730.7 | 1.5 | 18.2 | 626.9 | 84.1 | -- |
| | Total | 1,964.6 | 16.7 | 38.6 | 1,594.2 | 307.6 | 7.5 |

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[1/] Table may not add to totals due to rounding. Includes data from 1979 for the Superior National Forest.

Table 12.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for growing-stock trees, based on STEMS, Northern Pine Unit, Minnesota, 1977[1]

| Site productivity (ft³/ac/yr) | Potential achieved | All classes | Stand-age class (years) 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
|---|---|---|---|---|---|---|---|---|---|---|
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | 4.0 | -- | -- | 1.3 | -- | 1.3 | 1.4 | -- | -- |
| | 51-75 | 5.3 | -- | -- | -- | -- | -- | 3.9 | 1.4 | -- |
| | 76+ | 4.1 | -- | -- | 2.8 | -- | -- | 1.3 | -- | -- |
| | Total | 13.4 | -- | -- | 4.1 | -- | 1.3 | 6.6 | 1.4 | -- |
| 81-100 | 0-25 | 9.8 | -- | 3.3 | -- | 2.7 | 1.2 | 2.6 | -- | -- |
| | 26-50 | 62.4 | 1.2 | 2.7 | 13.1 | 6.7 | 18.8 | 10.4 | 6.8 | 2.7 |
| | 51-75 | 103.6 | 2.7 | 2.8 | 9.6 | 35.4 | 26.8 | 16.8 | 1.3 | 8.2 |
| | 76+ | 70.1 | 7.7 | -- | 13.2 | 20.9 | 16.2 | 4.0 | 1.3 | 6.8 |
| | Total | 245.9 | 11.6 | 8.8 | 35.9 | 65.7 | 63.0 | 33.8 | 9.4 | 17.7 |
| 61-80 | 0-25 | 107.8 | 31.1 | 12.8 | 7.2 | 15.0 | 15.7 | 14.8 | 4.6 | 6.6 |
| | 26-50 | 451.3 | 14.5 | 27.1 | 34.8 | 96.7 | 121.4 | 104.7 | 24.5 | 27.6 |
| | 51-75 | 468.1 | 9.7 | 30.4 | 30.4 | 82.6 | 151.8 | 101.1 | 43.6 | 18.5 |
| | 76+ | 284.4 | 80.6 | 34.9 | 16.9 | 45.1 | 52.6 | 38.6 | 11.9 | 3.8 |
| | Total | 1,311.6 | 135.9 | 105.2 | 89.3 | 239.4 | 341.5 | 259.2 | 84.6 | 56.5 |
| 41-60 | 0-25 | 145.8 | 46.1 | 31.2 | 14.7 | 10.6 | 13.9 | 15.8 | 9.4 | 4.1 |
| | 26-50 | 325.5 | 20.4 | 27.5 | 38.1 | 32.7 | 61.3 | 78.4 | 38.7 | 28.4 |
| | 51-75 | 273.5 | 17.6 | 42.4 | 15.5 | 36.8 | 71.6 | 51.0 | 29.0 | 9.6 |
| | 76+ | 147.2 | 60.0 | 26.2 | 2.7 | 5.5 | 9.7 | 14.8 | 13.2 | 15.1 |
| | Total | 892.0 | 144.1 | 127.3 | 71.0 | 85.6 | 156.5 | 160.0 | 90.3 | 57.2 |
| 21-40 | 0-25 | 44.3 | 13.4 | 16.1 | 1.6 | 6.0 | 4.4 | 2.8 | -- | -- |
| | 26-50 | 42.0 | 6.6 | 5.5 | 4.8 | 1.4 | 1.4 | 5.6 | 9.5 | 7.2 |
| | 51-75 | 25.0 | 6.0 | 2.8 | -- | 1.2 | 6.6 | 1.4 | 2.8 | 4.2 |
| | 76+ | 16.4 | 8.7 | 3.0 | -- | 1.7 | -- | 1.4 | 1.6 | -- |
| | Total | 127.7 | 34.7 | 27.4 | 6.4 | 10.3 | 12.4 | 11.2 | 13.9 | 11.4 |
| Total | 0-25 | 307.7 | 90.6 | 63.4 | 23.5 | 34.3 | 35.2 | 36.0 | 14.0 | 10.7 |
| | 26-50 | 885.2 | 42.7 | 62.8 | 92.1 | 137.5 | 204.2 | 200.5 | 79.5 | 65.9 |
| | 51-75 | 875.5 | 36.0 | 78.4 | 55.5 | 156.0 | 256.8 | 174.2 | 78.1 | 40.5 |
| | 76+ | 522.2 | 157.0 | 64.1 | 35.6 | 73.2 | 78.5 | 60.1 | 28.0 | 25.7 |
| | Total | 2,590.6 | 326.3 | 268.7 | 206.7 | 401.0 | 574.7 | 470.8 | 199.6 | 142.8 |

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[1] Table may not add to totals due to rounding. Includes data from 1980 for the Chippewa National Forest.

Table 13.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for all live trees, based on STEMS, Northern Pine Unit, Minnesota, 1977[1]

| Site productivity (ft³/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | 5.1 | -- | -- | 1.3 | -- | 1.3 | 2.5 | -- | -- |
| | 76+ | 8.3 | -- | -- | 2.8 | -- | -- | 4.1 | 1.4 | -- |
| | Total | 13.4 | -- | -- | 4.1 | -- | 1.3 | 6.6 | 1.4 | -- |
| 81-100 | 0-25 | 3.3 | -- | 3.3 | -- | -- | -- | -- | -- | -- |
| | 26-50 | 26.0 | -- | -- | 6.0 | 5.3 | 12.0 | 2.7 | -- | -- |
| | 51-75 | 69.2 | 1.3 | 2.7 | 8.8 | 19.3 | 14.6 | 13.0 | 6.8 | 2.7 |
| | 76+ | 147.4 | 10.3 | 2.8 | 21.1 | 41.1 | 36.4 | 18.1 | 2.6 | 15.0 |
| | Total | 245.9 | 11.6 | 8.8 | 35.9 | 65.7 | 63.0 | 33.8 | 9.4 | 17.7 |
| 61-80 | 0-25 | 53.0 | 28.4 | 5.1 | 4.4 | 6.7 | 4.3 | 2.4 | -- | 1.7 |
| | 26-50 | 231.4 | 7.7 | 17.6 | 19.8 | 48.9 | 57.9 | 55.4 | 13.1 | 11.0 |
| | 51-75 | 473.1 | 5.5 | 29.3 | 26.5 | 93.0 | 143.1 | 102.6 | 43.4 | 29.7 |
| | 76+ | 554.1 | 94.3 | 53.2 | 38.6 | 90.8 | 136.2 | 98.8 | 28.1 | 14.1 |
| | Total | 1,311.6 | 135.9 | 105.2 | 89.3 | 239.4 | 341.5 | 259.2 | 84.6 | 56.5 |
| 41-60 | 0-25 | 76.1 | 37.4 | 18.8 | 7.9 | 1.6 | 3.9 | 3.8 | 2.7 | -- |
| | 26-50 | 216.9 | 16.8 | 21.2 | 26.0 | 25.4 | 37.5 | 48.3 | 19.7 | 22.0 |
| | 51-75 | 315.0 | 14.5 | 50.7 | 28.7 | 36.3 | 68.4 | 60.5 | 37.2 | 18.7 |
| | 76 | 284.0 | 75.4 | 36.6 | 8.4 | 22.3 | 46.7 | 47.4 | 30.7 | 16.5 |
| | Total | 892.0 | 144.1 | 127.3 | 71.0 | 85.6 | 156.5 | 160.0 | 90.3 | 57.2 |
| 21-40 | 0-25 | 28.1 | 10.4 | 9.9 | 1.6 | 4.5 | 1.7 | -- | -- | -- |
| | 26-50 | 30.3 | 1.7 | 7.3 | 1.6 | 2.9 | 2.7 | 7.0 | 4.0 | 3.1 |
| | 51-75 | 37.4 | 6.7 | 7.2 | 1.6 | -- | 6.7 | 1.4 | 6.9 | 6.9 |
| | 76+ | 31.9 | 15.9 | 3.0 | 1.6 | 2.9 | 1.3 | 2.8 | 3.0 | 1.4 |
| | Total | 127.7 | 34.7 | 27.4 | 6.4 | 10.3 | 12.4 | 11.2 | 13.9 | 11.4 |
| Total | 0-25 | 160.5 | 76.2 | 37.1 | 13.9 | 12.8 | 9.9 | 6.2 | 2.7 | 1.7 |
| | 26-50 | 504.6 | 26.2 | 46.1 | 53.4 | 82.5 | 110.1 | 113.4 | 36.8 | 36.1 |
| | 51-75 | 899.8 | 28.0 | 89.9 | 66.9 | 148.6 | 234.1 | 180.0 | 94.3 | 58.0 |
| | 76+ | 1,025.7 | 195.9 | 95.6 | 72.5 | 157.1 | 220.6 | 171.2 | 65.8 | 47.0 |
| | Total | 2,590.6 | 326.3 | 268.7 | 206.7 | 401.0 | 574.7 | 470.8 | 199.6 | 142.8 |

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[1] Table may not add to totals due to rounding. Includes data from 1980 for the Chippewa National Forest.

Table 14.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for growing-stock trees, based on STEMS, Northern Pine Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | 4.0 | -- | -- | 2.7 | 1.3 | -- |
| | 51-75 | 5.3 | -- | -- | 5.3 | -- | -- |
| | 76+ | 4.1 | -- | -- | 4.1 | -- | -- |
| | Total | 13.4 | -- | -- | 12.1 | 1.3 | -- |
| 81-100 | 0-25 | 9.8 | -- | -- | 7.3 | 2.5 | -- |
| | 26-50 | 62.4 | -- | -- | 54.3 | 8.1 | -- |
| | 51-75 | 103.6 | -- | -- | 96.7 | 6.9 | -- |
| | 76+ | 70.1 | -- | -- | 63.5 | 6.6 | -- |
| | Total | 245.9 | -- | -- | 221.8 | 24.1 | -- |
| 61-80 | 0-25 | 107.8 | -- | 2.5 | 89.1 | 14.5 | 1.7 |
| | 26-50 | 451.3 | 2.1 | 6.1 | 397.9 | 42.7 | 2.5 |
| | 51-75 | 468.1 | -- | 5.4 | 438.0 | 24.7 | -- |
| | 76+ | 284.4 | -- | -- | 273.5 | 10.9 | -- |
| | Total | 1,311.6 | 2.1 | 14.0 | 1,198.5 | 92.8 | 4.2 |
| 41-60 | 0-25 | 145.8 | -- | 5.6 | 108.1 | 32.1 | -- |
| | 26-50 | 325.5 | 1.4 | 5.9 | 277.6 | 37.7 | 2.9 |
| | 51-75 | 273.5 | -- | 2.7 | 240.9 | 28.6 | 1.3 |
| | 76+ | 147.2 | -- | 3.1 | 127.8 | 14.6 | 1.7 |
| | Total | 892.0 | 1.4 | 17.3 | 754.4 | 113.0 | 5.9 |
| 21-40 | 0-25 | 44.3 | -- | 3.9 | 23.7 | 15.0 | 1.7 |
| | 26-50 | 42.0 | -- | 2.8 | 28.2 | 11.0 | -- |
| | 51-75 | 25.0 | -- | -- | 18.9 | 4.4 | 1.7 |
| | 76+ | 16.4 | -- | -- | 13.4 | 3.0 | -- |
| | Total | 127.7 | -- | 6.7 | 84.2 | 33.4 | 3.4 |
| Total | 0-25 | 307.7 | -- | 12.0 | 228.2 | 64.1 | 3.4 |
| | 26-50 | 885.2 | 3.5 | 14.8 | 760.7 | 100.8 | 5.4 |
| | 51-75 | 875.5 | -- | 8.1 | 799.8 | 64.6 | 3.0 |
| | 76+ | 522.2 | -- | 3.1 | 482.3 | 35.1 | 1.7 |
| | Total | 2,590.6 | 3.5 | 38.0 | 2,271.0 | 264.6 | 13.5 |

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[1] Table may not add to totals due to rounding. Includes data from 1980 for the Chippewa National Forest.

Table 15.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for all live trees, based on STEMS, Northern Pine Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | 5.1 | -- | -- | 3.8 | 1.3 | -- |
| | 76+ | 8.3 | -- | -- | 8.3 | -- | -- |
| | Total | 13.4 | -- | -- | 12.1 | 1.3 | -- |
| 81-100 | 0-25 | 3.3 | -- | -- | 3.3 | -- | -- |
| | 26-50 | 26.0 | -- | -- | 23.5 | 2.5 | -- |
| | 51-75 | 69.2 | -- | -- | 58.2 | 11.0 | -- |
| | 76+ | 147.4 | -- | -- | 136.8 | 10.6 | -- |
| | Total | 245.9 | -- | -- | 221.8 | 24.1 | -- |
| 61-80 | 0-25 | 53.0 | -- | 1.1 | 44.7 | 7.2 | -- |
| | 26-50 | 231.4 | -- | 5.9 | 199.6 | 21.7 | 4.2 |
| | 51-75 | 473.1 | 2.1 | 4.3 | 430.3 | 36.4 | -- |
| | 76+ | 554.1 | -- | 2.7 | 523.9 | 27.5 | -- |
| | Total | 1,311.6 | 2.1 | 14.0 | 1,198.5 | 92.8 | 4.2 |
| 41-60 | 0-25 | 76.1 | -- | 4.2 | 57.9 | 14.0 | -- |
| | 26-50 | 216.9 | 1.4 | 7.2 | 177.4 | 29.3 | 1.6 |
| | 51-75 | 315.0 | -- | 2.8 | 268.7 | 40.9 | 2.6 |
| | 76+ | 284.0 | -- | 3.1 | 250.4 | 28.8 | 1.7 |
| | Total | 892.0 | 1.4 | 17.3 | 754.4 | 113.0 | 5.9 |
| 21-40 | 0-25 | 28.1 | -- | 2.6 | 15.0 | 10.5 | -- |
| | 26-50 | 30.3 | -- | 2.8 | 21.3 | 4.5 | 1.7 |
| | 51-75 | 37.4 | -- | -- | 26.3 | 9.4 | 1.7 |
| | 76+ | 31.9 | -- | 1.3 | 21.6 | 9.0 | -- |
| | Total | 127.7 | -- | 6.7 | 84.2 | 33.4 | 3.4 |
| Total | 0-25 | 160.5 | -- | 7.9 | 120.9 | 31.7 | -- |
| | 26-50 | 504.6 | 1.4 | 15.9 | 421.8 | 58.0 | 7.5 |
| | 51-75 | 899.8 | 2.1 | 7.1 | 787.3 | 99.0 | 4.3 |
| | 76+ | 1,025.7 | -- | 7.1 | 941.0 | 75.9 | 1.7 |
| | Total | 2,590.6 | 3.5 | 38.0 | 2,271.0 | 264.6 | 13.5 |

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[1] Table may not add to totals due to rounding. Includes data from 1980 for the Chippewa National Forest.

Table 16.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for growing-stock trees, based on STEMS, Central Hardwood Unit, Minnesota, 1977[1/]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | 1.3 | -- | -- | 1.3 | -- | -- | -- | -- | -- |
| | 26-50 | 4.6 | -- | -- | -- | 3.2 | 1.4 | -- | -- | -- |
| | 51-75 | 2.8 | -- | -- | -- | 2.8 | -- | -- | -- | -- |
| | 76+ | 1.6 | -- | 1.6 | -- | -- | -- | -- | -- | -- |
| | Total | 10.3 | -- | 1.6 | 1.3 | 6.0 | 1.4 | -- | -- | -- |
| 61-80 | 0-25 | 17.1 | 1.6 | 5.7 | .5 | 1.3 | 5.6 | 1.1 | 1.4 | -- |
| | 26-50 | 111.5 | 5.6 | 6.2 | 9.7 | 31.9 | 38.1 | 15.8 | 3.0 | 1.3 |
| | 51-75 | 54.3 | 5.8 | 2.3 | 6.8 | 22.2 | 14.2 | 3.0 | -- | -- |
| | 76+ | 41.5 | 19.8 | 2.5 | 4.1 | 7.4 | 4.1 | 1.4 | -- | 2.1 |
| | Total | 224.5 | 32.8 | 16.7 | 21.2 | 62.8 | 62.1 | 21.3 | 4.3 | 3.4 |
| 41-60 | 0-25 | 61.0 | 13.8 | 6.5 | 3.9 | 11.0 | 8.7 | 10.0 | 5.7 | 1.3 |
| | 26-50 | 130.2 | 7.3 | 5.5 | 2.7 | 27.5 | 46.9 | 24.8 | 11.4 | 4.2 |
| | 51-75 | 72.1 | 10.3 | 5.6 | 4.3 | 10.0 | 23.0 | 14.6 | 2.8 | 1.6 |
| | 76+ | 42.1 | 24.4 | 6.2 | 2.8 | 3.0 | 1.6 | 2.8 | 1.4 | -- |
| | Total | 305.4 | 55.7 | 23.8 | 13.7 | 51.5 | 80.2 | 52.2 | 21.2 | 7.1 |
| 21-40 | 0-25 | 9.4 | -- | 3.2 | 1.6 | 1.6 | -- | 1.7 | -- | 1.3 |
| | 26-50 | 8.0 | -- | -- | 1.4 | 1.6 | -- | 5.0 | -- | -- |
| | 51-75 | 6.9 | -- | 1.3 | -- | 1.4 | 2.6 | 1.6 | -- | -- |
| | 76+ | 1.6 | -- | 1.6 | -- | -- | -- | -- | -- | -- |
| | Total | 25.9 | -- | 6.1 | 3.0 | 4.6 | 2.6 | 8.3 | -- | 1.3 |
| Total | 0-25 | 88.7 | 15.4 | 15.4 | 7.3 | 13.9 | 14.3 | 12.8 | 7.1 | 2.6 |
| | 26-50 | 254.3 | 12.9 | 11.6 | 13.8 | 64.1 | 86.4 | 45.7 | 14.3 | 5.5 |
| | 51-75 | 136.1 | 16.1 | 9.2 | 11.1 | 36.4 | 39.9 | 19.1 | 2.8 | 1.6 |
| | 76+ | 86.9 | 44.2 | 11.9 | 6.9 | 10.4 | 5.8 | 4.1 | 1.4 | 2.1 |
| | Total | 566.0 | 88.6 | 48.2 | 39.1 | 124.8 | 146.3 | 81.7 | 25.6 | 11.7 |

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[1/] Table may not add to totals due to rounding.

Table 17.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for all live trees, based on STEMS, Central Hardwood Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | 1.3 | -- | -- | 1.3 | -- | -- | -- | -- | -- |
| | 26-50 | 3.0 | -- | -- | -- | 1.6 | 1.4 | -- | -- | -- |
| | 51-75 | 4.4 | -- | -- | -- | 4.4 | -- | -- | -- | -- |
| | 76+ | 1.6 | -- | 1.6 | -- | -- | -- | -- | -- | -- |
| | Total | 10.3 | -- | 1.6 | 1.3 | 6.0 | 1.4 | -- | -- | -- |
| 61-80 | 0-25 | 9.4 | 1.6 | 3.2 | .5 | 1.3 | 1.4 | -- | 1.4 | -- |
| | 26-50 | 48.4 | 4.3 | 5.5 | 2.6 | 12.4 | 14.3 | 8.0 | -- | 1.3 |
| | 51-75 | 93.8 | 1.6 | 4.7 | 8.3 | 32.3 | 33.5 | 10.3 | 3.0 | -- |
| | 76+ | 72.9 | 25.3 | 3.2 | 9.7 | 16.8 | 12.8 | 3.0 | -- | 2.1 |
| | Total | 224.5 | 32.8 | 16.7 | 21.2 | 62.8 | 62.1 | 21.3 | 4.3 | 3.4 |
| 41-60 | 0-25 | 24.0 | 6.0 | 3.3 | -- | 6.6 | -- | 5.6 | 1.3 | 1.3 |
| | 26-50 | 90.6 | 4.5 | 5.9 | 6.6 | 21.6 | 26.3 | 15.7 | 10.1 | -- |
| | 51-75 | 101.6 | 7.4 | 4.0 | 2.7 | 14.1 | 44.0 | 17.9 | 5.8 | 5.8 |
| | 76+ | 89.2 | 37.9 | 10.6 | 4.4 | 9.3 | 9.9 | 13.0 | 4.0 | -- |
| | Total | 305.4 | 55.7 | 23.8 | 13.7 | 51.5 | 80.2 | 52.2 | 21.2 | 7.1 |
| 21-40 | 0-25 | 6.5 | -- | 2.0 | 1.6 | -- | -- | 1.7 | -- | 1.3 |
| | 26-50 | 10.8 | -- | 1.3 | 1.4 | 3.2 | -- | 5.0 | -- | -- |
| | 51-75 | 3.9 | -- | 1.3 | -- | 1.4 | 1.3 | -- | -- | -- |
| | 76+ | 4.6 | -- | 1.6 | -- | -- | 1.4 | 1.6 | -- | -- |
| | Total | 25.9 | -- | 6.1 | 3.0 | 4.6 | 2.6 | 8.3 | -- | 1.3 |
| Total | 0-25 | 41.2 | 7.6 | 8.4 | 3.4 | 7.9 | 1.4 | 7.3 | 2.6 | 2.6 |
| | 26-50 | 152.9 | 8.8 | 12.6 | 10.6 | 38.8 | 42.0 | 28.7 | 10.1 | 1.3 |
| | 51-75 | 203.7 | 9.0 | 10.1 | 11.0 | 52.1 | 78.7 | 28.2 | 8.8 | 5.8 |
| | 76+ | 168.2 | 63.1 | 17.0 | 14.1 | 26.0 | 24.2 | 17.6 | 4.0 | 2.1 |
| | Total | 566.0 | 88.6 | 48.2 | 39.1 | 124.8 | 146.3 | 81.7 | 25.6 | 11.7 |

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[1] Table may not add to totals due to rounding.

Table 18.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for growing-stock trees, based on STEMS, Central Hardwood Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | 1.3 | -- | -- | -- | 1.3 | -- |
| | 26-50 | 4.6 | -- | -- | 3.0 | 1.6 | -- |
| | 51-75 | 2.8 | -- | -- | 2.8 | -- | -- |
| | 76+ | 1.6 | -- | -- | 1.6 | -- | -- |
| | Total | 10.3 | -- | -- | 7.4 | 2.9 | -- |
| 61-80 | 0-25 | 17.1 | -- | -- | 11.4 | 5.7 | -- |
| | 26-50 | 111.5 | -- | -- | 104.6 | 7.0 | -- |
| | 51-75 | 54.3 | 1.4 | -- | 50.0 | 3.0 | -- |
| | 76+ | 41.5 | -- | -- | 38.3 | 3.2 | -- |
| | Total | 224.5 | 1.4 | -- | 204.3 | 18.8 | -- |
| 41-60 | 0-25 | 61.0 | -- | -- | 50.6 | 10.4 | -- |
| | 26-50 | 130.2 | -- | 1.6 | 111.7 | 15.4 | 1.6 |
| | 51-75 | 72.1 | 1.4 | -- | 57.7 | 13.0 | -- |
| | 76+ | 42.1 | -- | 1.7 | 33.6 | 6.8 | -- |
| | Total | 305.4 | 1.4 | 3.2 | 253.7 | 45.5 | 1.6 |
| 21-40 | 0-25 | 9.4 | -- | -- | 3.0 | 6.4 | -- |
| | 26-50 | 8.0 | -- | -- | 5.7 | 2.3 | -- |
| | 51-75 | 6.9 | -- | -- | 5.3 | 1.6 | -- |
| | 76+ | 1.6 | -- | -- | 1.6 | -- | -- |
| | Total | 25.9 | -- | -- | 15.6 | 10.3 | -- |
| Total | 0-25 | 88.7 | -- | -- | 65.0 | 23.7 | -- |
| | 26-50 | 254.3 | -- | 1.6 | 224.9 | 26.3 | 1.6 |
| | 51-75 | 136.1 | 2.7 | -- | 115.8 | 17.5 | -- |
| | 76+ | 86.9 | -- | 1.7 | 75.1 | 10.0 | -- |
| | Total | 566.0 | 2.7 | 3.2 | 480.9 | 77.5 | 1.6 |

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[1] Table may not add to totals due to rounding.

Table 19.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for all live trees, based on STEMS, Central Hardwood Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | 1.3 | -- | -- | -- | 1.3 | -- |
| | 26-50 | 3.0 | -- | -- | 3.0 | -- | -- |
| | 51-75 | 4.4 | -- | -- | 2.8 | 1.6 | -- |
| | 76+ | 1.6 | -- | -- | 1.6 | -- | -- |
| | Total | 10.3 | -- | -- | 7.4 | 2.9 | -- |
| 61-80 | 0-25 | 9.4 | -- | -- | 5.1 | 4.3 | -- |
| | 26-50 | 48.4 | -- | -- | 46.8 | 1.6 | -- |
| | 51-75 | 93.8 | 1.4 | -- | 84.1 | 8.4 | -- |
| | 76+ | 72.9 | -- | -- | 68.3 | 4.6 | -- |
| | Total | 224.5 | 1.4 | -- | 204.3 | 18.8 | -- |
| 41-60 | 0-25 | 24.0 | -- | -- | 19.6 | 4.3 | -- |
| | 26-50 | 90.6 | -- | 1.6 | 74.7 | 14.4 | -- |
| | 51-75 | 101.6 | -- | -- | 88.9 | 11.1 | 1.6 |
| | 76+ | 89.2 | 1.4 | 1.7 | 70.4 | 15.7 | -- |
| | Total | 305.4 | 1.4 | 3.2 | 253.7 | 45.5 | 1.6 |
| 21-40 | 0-25 | 6.5 | -- | -- | 3.0 | 3.5 | -- |
| | 26-50 | 10.8 | -- | -- | 5.7 | 5.2 | -- |
| | 51-75 | 3.9 | -- | -- | 3.9 | -- | -- |
| | 76+ | 4.6 | -- | -- | 3.0 | 1.6 | -- |
| | Total | 25.9 | -- | -- | 15.6 | 10.3 | -- |
| Total | 0-25 | 41.2 | -- | -- | 27.7 | 13.4 | -- |
| | 26-50 | 152.9 | -- | 1.6 | 130.1 | 21.2 | -- |
| | 51-75 | 203.7 | 1.4 | -- | 179.7 | 21.0 | 1.6 |
| | 76+ | 168.2 | 1.4 | 1.7 | 143.3 | 21.8 | -- |
| | Total | 566.0 | 2.7 | 3.2 | 480.9 | 77.5 | 1.6 |

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[1] Table may not add to totals due to rounding.

Table 20.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for growing-stock trees, based on STEMS, Prairie Unit, Minnesota, 1977[1/]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 61-80 | 0-25 | 1.4 | -- | -- | -- | -- | 1.4 | -- | -- | -- |
| | 26-50 | 9.5 | -- | 1.3 | 1.4 | 4.0 | 1.4 | 1.3 | -- | -- |
| | 51-75 | 20.9 | -- | 4.3 | 4.1 | 5.8 | 6.7 | -- | -- | -- |
| | 76+ | 8.8 | 1.3 | 1.3 | 3.0 | 1.4 | 1.7 | -- | -- | -- |
| | Total | 40.7 | 1.3 | 7.0 | 8.5 | 11.2 | 11.3 | 1.3 | -- | -- |
| 41-60 | 0-25 | 41.0 | 14.2 | 5.6 | 4.5 | 11.0 | 3.0 | 2.8 | -- | -- |
| | 26-50 | 49.8 | 1.6 | 9.7 | 8.7 | 9.4 | 15.0 | 4.1 | 1.3 | -- |
| | 51-75 | 31.0 | 10.8 | 5.4 | 1.7 | 6.1 | 5.6 | 1.3 | -- | -- |
| | 76+ | 37.7 | 19.2 | 6.5 | -- | 7.9 | 1.4 | 1.3 | 1.3 | -- |
| | Total | 159.4 | 45.9 | 27.2 | 14.9 | 34.4 | 25.0 | 9.5 | 2.6 | -- |
| 21-40 | 0-25 | 20.2 | 6.4 | 4.4 | 1.3 | 2.6 | 2.8 | 1.3 | 1.3 | -- |
| | 26-50 | 18.8 | 1.7 | 1.3 | -- | -- | 5.3 | 2.7 | 4.1 | 3.8 |
| | 51-75 | 12.9 | 1.6 | 5.9 | -- | -- | 2.6 | 1.3 | -- | 1.3 |
| | 76+ | 4.0 | 4.0 | -- | -- | -- | -- | -- | -- | -- |
| | Total | 55.9 | 13.8 | 11.7 | 1.3 | 2.6 | 10.7 | 5.3 | 5.4 | 5.1 |
| Total | 0-25 | 62.7 | 20.6 | 10.0 | 5.8 | 13.6 | 7.2 | 4.1 | 1.3 | -- |
| | 26-50 | 78.1 | 3.4 | 12.4 | 10.1 | 13.3 | 21.7 | 8.1 | 5.4 | 3.8 |
| | 51-75 | 64.8 | 12.5 | 15.7 | 5.8 | 11.9 | 15.0 | 2.6 | -- | 1.3 |
| | 76+ | 50.5 | 24.5 | 7.8 | 3.0 | 9.4 | 3.1 | 1.3 | 1.3 | -- |
| | Total | 256.0 | 61.0 | 45.9 | 24.7 | 48.3 | 47.0 | 16.1 | 8.0 | 5.1 |

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[1/] Table may not add to totals due to rounding.

Table 21.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for all live trees, based on STEMS, Prairie Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 61-80 | 0-25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 26-50 | 2.7 | -- | 1.3 | -- | 1.3 | -- | -- | -- | -- |
| | 51-75 | 12.3 | -- | 3.0 | -- | 5.0 | 2.9 | 1.3 | -- | -- |
| | 76+ | 25.8 | 1.3 | 2.6 | 8.5 | 4.9 | 8.4 | -- | -- | -- |
| | Total | 40.7 | 1.3 | 7.0 | 8.5 | 11.2 | 11.3 | 1.3 | -- | -- |
| 41-60 | 0-25 | 15.4 | 7.8 | 1.1 | 1.7 | 4.8 | -- | -- | -- | -- |
| | 26-50 | 37.2 | 3.4 | 2.7 | 10.4 | 5.7 | 12.3 | 2.8 | -- | -- |
| | 51-75 | 43.3 | 3.0 | 8.9 | 2.8 | 14.6 | 8.5 | 4.1 | 1.3 | -- |
| | 76+ | 63.5 | 31.6 | 14.5 | -- | 9.3 | 4.2 | 2.6 | 1.3 | -- |
| | Total | 159.4 | 45.9 | 27.2 | 14.9 | 34.4 | 25.0 | 9.5 | 2.6 | -- |
| 21-40 | 0-25 | 4.4 | 3.0 | -- | -- | -- | 1.4 | -- | -- | -- |
| | 26-50 | 22.0 | 1.7 | 4.4 | 1.3 | 2.6 | 5.3 | 2.7 | 4.0 | -- |
| | 51-75 | 16.1 | 1.6 | 1.3 | -- | -- | 4.0 | 2.7 | 1.4 | 5.1 |
| | 76+ | 13.4 | 7.4 | 5.9 | -- | -- | -- | -- | -- | -- |
| | Total | 55.9 | 13.8 | 11.7 | 1.3 | 2.6 | 10.7 | 5.3 | 5.4 | 5.1 |
| Total | 0-25 | 19.8 | 10.8 | 1.1 | 1.7 | 4.8 | 1.4 | -- | -- | -- |
| | 26-50 | 61.9 | 5.1 | 8.4 | 11.7 | 9.7 | 17.6 | 5.4 | 4.0 | -- |
| | 51-75 | 71.6 | 4.7 | 13.3 | 2.8 | 19.7 | 15.3 | 8.1 | 2.8 | 5.1 |
| | 76+ | 102.7 | 40.4 | 23.1 | 8.5 | 14.1 | 12.6 | 2.6 | 1.3 | -- |
| | Total | 256.0 | 61.0 | 45.9 | 24.7 | 48.3 | 47.0 | 16.1 | 8.0 | 5.1 |

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[1] Table may not add to totals due to rounding.

Table 22.--Area of aspen type commercial forest land by site productivity class, and potential achieved, and physiographic class, for growing-stock trees, based on STEMS, Prairie Unit, Minnesota, 1977[1]

| Site productivity (ft$^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- |
| 61-80 | 0-25 | 1.4 | -- | -- | 1.4 | -- | -- |
| | 26-50 | 9.5 | -- | -- | 9.5 | -- | -- |
| | 51-75 | 20.9 | -- | -- | 19.9 | 1.1 | -- |
| | 76+ | 8.8 | -- | -- | 8.8 | -- | -- |
| | Total | 40.7 | -- | -- | 39.6 | 1.1 | -- |
| 41-60 | 0-25 | 41.0 | -- | -- | 36.2 | 4.8 | -- |
| | 26-50 | 49.8 | -- | -- | 49.8 | -- | -- |
| | 51-75 | 31.0 | -- | -- | 29.6 | 1.3 | -- |
| | 76+ | 37.7 | -- | -- | 37.7 | -- | -- |
| | Total | 159.4 | -- | -- | 153.3 | 6.1 | -- |
| 21-40 | 0-25 | 20.2 | -- | -- | 18.9 | 1.3 | -- |
| | 26-50 | 18.8 | -- | -- | 18.8 | -- | -- |
| | 51-75 | 12.9 | -- | -- | 12.9 | -- | -- |
| | 76+ | 4.0 | -- | -- | 2.7 | 1.3 | -- |
| | Total | 55.9 | -- | -- | 53.3 | 2.7 | -- |
| Total | 0-25 | 62.7 | -- | -- | 56.6 | 6.1 | -- |
| | 26-50 | 78.1 | -- | -- | 78.1 | -- | -- |
| | 51-75 | 64.8 | -- | -- | 62.4 | 2.4 | -- |
| | 76+ | 50.5 | -- | -- | 49.2 | 1.3 | -- |
| | Total | 256.0 | -- | -- | 246.2 | 9.8 | -- |

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[1] Table may not add to totals due to rounding.

Table 23.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for all live trees, based on STEMS, Prairie Unit, Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- |
| 81-100 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | -- | -- | -- | -- | -- | -- |
| | 51-75 | -- | -- | -- | -- | -- | -- |
| | 76+ | -- | -- | -- | -- | -- | -- |
| | Total | -- | -- | -- | -- | -- | -- |
| 61-80 | 0-25 | -- | -- | -- | -- | -- | -- |
| | 26-50 | 2.7 | -- | -- | 2.7 | -- | -- |
| | 51-75 | 12.3 | -- | -- | 11.2 | 1.1 | -- |
| | 76+ | 25.8 | -- | -- | 25.8 | -- | -- |
| | Total | 40.7 | -- | -- | 39.6 | 1.1 | -- |
| 41-60 | 0-25 | 15.4 | -- | -- | 12.3 | 3.1 | -- |
| | 26-50 | 37.2 | -- | -- | 35.6 | 1.6 | -- |
| | 51-75 | 43.3 | -- | -- | 43.3 | -- | -- |
| | 76+ | 63.5 | -- | -- | 62.2 | 1.3 | -- |
| | Total | 159.4 | -- | -- | 153.3 | 6.1 | -- |
| 21-40 | 0-25 | 4.4 | -- | -- | 3.1 | 1.3 | -- |
| | 26-50 | 22.0 | -- | -- | 22.0 | -- | -- |
| | 51-75 | 16.1 | -- | -- | 16.1 | -- | -- |
| | 76+ | 13.4 | -- | -- | 12.0 | 1.3 | -- |
| | Total | 55.9 | -- | -- | 53.3 | 2.7 | -- |
| Total | 0-25 | 19.8 | -- | -- | 15.4 | 4.4 | -- |
| | 26-50 | 61.9 | -- | -- | 60.3 | 1.6 | -- |
| | 51-75 | 71.6 | -- | -- | 70.6 | 1.1 | -- |
| | 76+ | 102.7 | -- | -- | 100.0 | 2.7 | -- |
| | Total | 256.0 | -- | -- | 246.2 | 9.8 | -- |

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[1] Table may not add to totals due to rounding.

Table 24.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for growing-stock trees, based on Kittredge and Gevorkiantz (1929), Minnesota, 1977[1/]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | 12.6 | 1.4 | 3.3 | 2.6 | 2.7 | 1.2 | 1.4 | -- | -- |
| | 26-50 | 94.6 | 2.6 | 4.1 | 11.4 | 21.0 | 26.8 | 17.8 | 4.2 | 6.7 |
| | 51-75 | 104.1 | 1.3 | 5.6 | 7.0 | 33.7 | 32.4 | 15.9 | -- | 8.2 |
| | 76+ | 55.9 | 8.5 | 4.4 | 17.6 | 10.2 | 5.6 | 5.5 | 1.4 | 2.7 |
| | Total | 267.2 | 13.8 | 17.4 | 38.6 | 67.6 | 66.0 | 40.6 | 5.6 | 17.6 |
| 81-100 | 0-25 | 124.9 | 31.5 | 9.0 | 9.3 | 19.2 | 25.0 | 18.5 | 5.8 | 6.6 |
| | 26-50 | 689.3 | 27.5 | 39.3 | 75.4 | 158.9 | 184.3 | 142.7 | 34.0 | 27.2 |
| | 51-75 | 675.0 | 19.7 | 43.2 | 57.4 | 148.0 | 193.7 | 125.9 | 61.1 | 25.9 |
| | 76+ | 454.2 | 114.9 | 42.5 | 36.0 | 95.9 | 104.2 | 47.3 | 8.0 | 5.3 |
| | Total | 1,943.3 | 193.6 | 134.0 | 178.2 | 422.0 | 507.3 | 334.4 | 108.9 | 65.0 |
| 61-80 | 0-25 | 182.8 | 68.0 | 28.6 | 26.4 | 14.3 | 19.8 | 12.0 | 5.4 | 8.3 |
| | 26-50 | 612.2 | 32.1 | 30.2 | 34.0 | 81.6 | 169.6 | 133.2 | 62.5 | 69.1 |
| | 51-75 | 616.1 | 53.6 | 41.3 | 51.0 | 77.0 | 152.6 | 164.6 | 53.4 | 22.7 |
| | 76+ | 622.1 | 160.1 | 87.8 | 28.5 | 61.7 | 104.1 | 107.6 | 40.5 | 31.9 |
| | Total | 2,033.1 | 313.7 | 187.9 | 139.9 | 234.5 | 446.0 | 417.4 | 161.8 | 131.9 |
| 41-60 | 0-25 | 121.5 | 48.5 | 20.2 | 16.5 | 12.3 | 7.2 | 11.0 | 4.5 | 1.3 |
| | 26-50 | 191.1 | 26.3 | 24.4 | 14.6 | 20.5 | 32.5 | 42.9 | 18.4 | 11.6 |
| | 51-75 | 219.8 | 14.9 | 44.5 | 19.3 | 17.9 | 35.9 | 58.4 | 21.9 | 7.0 |
| | 76+ | 279.5 | 84.0 | 52.0 | 8.4 | 25.5 | 31.5 | 31.7 | 23.4 | 22.9 |
| | Total | 811.8 | 173.6 | 141.1 | 58.9 | 76.2 | 107.1 | 144.0 | 68.2 | 42.8 |
| 21-40 | 0-25 | 55.8 | 18.9 | 17.8 | 6.4 | 5.8 | 2.8 | 1.4 | -- | 2.8 |
| | 26-50 | 67.3 | 10.9 | 14.1 | 5.7 | 8.6 | 5.7 | 11.3 | 5.3 | 5.5 |
| | 51-75 | 84.2 | 8.0 | 4.4 | 9.0 | 3.0 | 8.0 | 19.1 | 21.8 | 11.0 |
| | 76+ | 114.4 | 24.1 | 29.5 | 4.2 | 7.4 | 22.6 | 11.2 | 9.8 | 5.5 |
| | Total | 321.7 | 61.9 | 65.8 | 25.3 | 24.8 | 39.1 | 43.0 | 37.0 | 24.8 |
| Total | 0-25 | 497.5 | 168.2 | 78.9 | 61.1 | 54.3 | 56.0 | 44.3 | 15.7 | 19.0 |
| | 26-50 | 1,654.5 | 99.4 | 112.1 | 141.1 | 290.6 | 418.9 | 347.9 | 124.3 | 120.1 |
| | 51-75 | 1,699.1 | 97.3 | 139.1 | 143.7 | 279.6 | 422.6 | 383.8 | 158.2 | 74.7 |
| | 76+ | 1,526.1 | 391.5 | 216.2 | 94.8 | 200.7 | 268.1 | 203.3 | 83.1 | 68.3 |
| | Total | 5,377.2 | 756.5 | 546.3 | 440.8 | 825.2 | 1,165.5 | 979.4 | 381.4 | 282.1 |

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[1/] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

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Table 25.--Area of aspen type commercial forest land by site productivity class, potential achieved, and stand-age class, for all live trees, based on Kittredge and Gevorkiantz (1929), Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Stand-age class (years) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+ |
| | Percent | Thousand acres | | | | | | | | |
| 101-120 | 0-25 | 7.4 | 1.4 | 3.3 | 1.3 | -- | -- | 1.4 | -- | -- |
| | 26-50 | 42.2 | -- | 2.8 | 6.9 | 11.0 | 13.2 | 2.7 | 2.8 | 2.8 |
| | 51-75 | 97.5 | 2.7 | 2.9 | 8.5 | 24.7 | 27.4 | 19.2 | 1.4 | 10.7 |
| | 76+ | 120.1 | 9.7 | 8.4 | 21.9 | 31.9 | 25.4 | 17.3 | 1.4 | 4.1 |
| | Total | 267.2 | 13.8 | 17.4 | 38.6 | 67.6 | 66.0 | 40.6 | 5.6 | 17.6 |
| 81-100 | 0-25 | 54.3 | 28.8 | 4.8 | 3.0 | 9.5 | 4.1 | 2.4 | -- | 1.7 |
| | 26-50 | 364.0 | 13.1 | 27.7 | 25.3 | 89.2 | 108.6 | 76.7 | 12.9 | 10.4 |
| | 51-75 | 689.9 | 4.1 | 30.0 | 75.8 | 148.8 | 193.9 | 142.8 | 62.2 | 32.4 |
| | 76+ | 835.2 | 147.5 | 71.5 | 74.1 | 174.5 | 200.7 | 112.5 | 33.8 | 20.5 |
| | Total | 1,943.3 | 193.6 | 134.0 | 178.2 | 422.0 | 507.3 | 334.4 | 108.9 | 65.0 |
| 61-80 | 0-25 | 102.8 | 50.6 | 17.2 | 16.7 | 6.7 | 5.9 | 1.3 | 1.4 | 3.0 |
| | 26-50 | 346.3 | 18.5 | 21.6 | 30.7 | 55.9 | 87.5 | 85.4 | 32.8 | 13.8 |
| | 51-75 | 606.2 | 36.7 | 36.9 | 37.8 | 69.0 | 159.0 | 145.3 | 54.6 | 66.9 |
| | 76+ | 977.9 | 207.9 | 112.2 | 54.8 | 102.9 | 193.6 | 185.4 | 73.0 | 48.2 |
| | Total | 2,033.1 | 313.7 | 187.9 | 139.9 | 234.6 | 446.0 | 417.4 | 161.8 | 131.9 |
| 41-60 | 0-25 | 57.6 | 34.4 | 2.6 | 5.0 | 4.4 | 2.7 | 7.0 | 1.4 | -- |
| | 26-50 | 136.1 | 17.1 | 27.7 | 16.2 | 16.8 | 18.4 | 31.4 | 5.8 | 2.7 |
| | 51-75 | 183.5 | 6.1 | 27.7 | 22.3 | 20.1 | 29.3 | 50.6 | 16.7 | 10.8 |
| | 76+ | 434.7 | 116.0 | 83.2 | 15.3 | 34.9 | 56.7 | 55.0 | 44.3 | 29.3 |
| | Total | 811.8 | 173.6 | 141.1 | 58.9 | 76.2 | 107.1 | 144.0 | 68.2 | 42.8 |
| 21-40 | 0-25 | 24.2 | 9.7 | 7.0 | 3.2 | 4.3 | -- | -- | -- | -- |
| | 26-50 | 47.8 | 8.0 | 12.0 | 6.2 | 4.5 | 5.8 | 7.2 | 1.2 | 2.8 |
| | 51-75 | 53.2 | 3.4 | 7.2 | 5.8 | 4.5 | 5.2 | 14.7 | 5.5 | 7.0 |
| | 76+ | 196.4 | 40.7 | 39.7 | 10.1 | 11.5 | 28.1 | 21.1 | 30.3 | 15.0 |
| | Total | 321.7 | 61.9 | 65.8 | 25.3 | 24.8 | 39.1 | 43.0 | 37.0 | 24.8 |
| Total | 0-25 | 246.2 | 124.9 | 34.9 | 29.2 | 25.0 | 12.7 | 12.1 | 2.8 | 4.7 |
| | 26-50 | 936.4 | 56.8 | 91.8 | 85.3 | 177.4 | 233.5 | 203.5 | 55.5 | 32.5 |
| | 51-75 | 1,630.4 | 53.0 | 104.7 | 150.1 | 267.1 | 414.8 | 372.5 | 140.4 | 127.8 |
| | 76+ | 2,564.3 | 521.9 | 314.9 | 176.2 | 355.6 | 504.5 | 391.3 | 182.8 | 117.1 |
| | Total | 5,377.2 | 756.5 | 546.3 | 440.8 | 825.2 | 1,165.5 | 979.4 | 381.4 | 282.1 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

able 26.--Area of aspen type commercial forest land by site productivity class, potential achieved, and phsyiographic class, for growing-stock trees, based on Kittredge and Gevorkiantz, Minnesota (1929), 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | 12.6 | -- | -- | 6.1 | 6.5 | -- |
| | 26-50 | 94.6 | -- | 1.4 | 90.3 | 3.0 | -- |
| | 51-75 | 104.1 | -- | -- | 96.2 | 7.9 | -- |
| | 76+ | 55.9 | -- | -- | 50.5 | 5.4 | -- |
| | Total | 267.2 | -- | 1.4 | 243.1 | 22.8 | -- |
| 81-100 | 0-25 | 124.9 | -- | 1.4 | 100.9 | 20.9 | 1.7 |
| | 26-50 | 689.3 | -- | 9.0 | 574.1 | 100.5 | 5.7 |
| | 51-75 | 675.0 | 3.5 | 6.8 | 633.3 | 31.4 | -- |
| | 76+ | 454.2 | -- | 2.9 | 416.7 | 34.6 | -- |
| | Total | 1,943.3 | 3.5 | 20.1 | 1,725.0 | 187.4 | 7.4 |
| 61-80 | 0-25 | 182.8 | -- | 4.1 | 143.0 | 35.7 | -- |
| | 26-50 | 612.2 | -- | 8.5 | 532.7 | 71.0 | -- |
| | 51-75 | 616.1 | -- | 8.5 | 496.3 | 108.6 | 2.6 |
| | 76+ | 622.1 | 2.9 | 9.5 | 555.2 | 52.9 | 1.7 |
| | Total | 2,033.1 | 2.9 | 30.6 | 1,727.2 | 268.2 | 4.3 |
| 41-60 | 0-25 | 121.5 | -- | 3.2 | 90.4 | 27.9 | -- |
| | 26-50 | 191.1 | 13.8 | 2.8 | 149.2 | 22.1 | 3.2 |
| | 51-75 | 219.8 | 1.4 | 4.5 | 176.9 | 37.0 | -- |
| | 76+ | 279.5 | -- | 6.2 | 246.7 | 26.6 | -- |
| | Total | 811.8 | 15.2 | 16.7 | 663.2 | 113.6 | 3.2 |
| 21-40 | 0-25 | 55.8 | -- | 3.9 | 27.9 | 18.0 | 6.0 |
| | 26-50 | 67.3 | -- | -- | 56.1 | 11.1 | -- |
| | 51-75 | 84.2 | 1.4 | 2.8 | 61.3 | 18.7 | -- |
| | 76+ | 114.4 | -- | 4.4 | 88.6 | 19.7 | 1.7 |
| | Total | 321.7 | 1.4 | 11.1 | 233.9 | 67.6 | 7.7 |
| Total | 0-25 | 497.5 | -- | 12.6 | 368.3 | 108.9 | 7.7 |
| | 26-50 | 1,654.5 | 13.8 | 21.7 | 1,402.4 | 207.7 | 8.9 |
| | 51-75 | 1,699.1 | 6.3 | 22.6 | 1,463.9 | 203.7 | 2.6 |
| | 76+ | 1,526.1 | 2.9 | 23.0 | 1,357.7 | 139.2 | 3.4 |
| | Total | 5,377.2 | 22.9 | 79.8 | 4,592.3 | 659.5 | 22.6 |

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[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

Table 27.--Area of aspen type commercial forest land by site productivity class, potential achieved, and physiographic class, for all live trees, based on Kittredge and Gevorkiantz (1929), Minnesota, 1977[1]

| Site productivity ($ft^3$/ac/yr) | Potential achieved | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|---|
| | | | Xeric | Xeromesic | Mesic | Hydromesic | Hydric |
| | Percent | Thousand acres | | | | | |
| 101-120 | 0-25 | 7.4 | -- | -- | 4.7 | 2.7 | -- |
| | 26-50 | 42.2 | -- | 1.4 | 35.6 | 5.2 | -- |
| | 51-75 | 97.5 | -- | -- | 93.3 | 4.3 | -- |
| | 76+ | 120.1 | -- | -- | 109.5 | 10.6 | -- |
| | Total | 267.2 | -- | 1.4 | 243.1 | 22.8 | -- |
| 81-100 | 0-25 | 54.3 | -- | -- | 45.6 | 8.7 | -- |
| | 26-50 | 364.0 | -- | 7.6 | 283.7 | 68.2 | 4.5 |
| | 51-75 | 689.9 | 2.1 | 5.5 | 628.9 | 50.4 | 2.9 |
| | 76+ | 835.2 | 1.4 | 7.0 | 766.7 | 60.1 | -- |
| | Total | 1,943.3 | 3.5 | 20.1 | 1,725.0 | 187.4 | 7.4 |
| 61-80 | 0-25 | 102.8 | -- | 2.5 | 81.7 | 18.5 | -- |
| | 26-50 | 346.3 | -- | 4.2 | 299.1 | 43.1 | -- |
| | 51-75 | 606.2 | -- | 10.2 | 484.0 | 109.4 | 2.6 |
| | 76+ | 977.9 | 2.9 | 13.7 | 862.4 | 97.3 | 1.7 |
| | Total | 2,033.1 | 2.9 | 30.6 | 1,727.2 | 268.2 | 4.3 |
| 41-60 | 0-25 | 57.6 | -- | 3.2 | 45.6 | 8.7 | -- |
| | 26-50 | 136.1 | 13.8 | 2.8 | 94.3 | 25.2 | -- |
| | 51-75 | 183.5 | 1.4 | 3.1 | 151.8 | 25.7 | 1.6 |
| | 76+ | 434.7 | -- | 7.6 | 371.5 | 54.0 | 1.6 |
| | Total | 811.8 | 15.2 | 16.7 | 663.2 | 113.6 | 3.2 |
| 21-40 | 0-25 | 24.2 | -- | 2.6 | 9.7 | 8.9 | 3.0 |
| | 26-50 | 47.8 | -- | -- | 35.5 | 12.3 | -- |
| | 51-75 | 53.2 | -- | 1.4 | 39.2 | 12.6 | -- |
| | 76+ | 196.4 | 1.4 | 7.1 | 149.5 | 33.7 | 4.7 |
| | Total | 321.7 | 1.4 | 11.1 | 233.9 | 67.6 | 7.7 |
| Total | 0-25 | 246.2 | -- | 8.3 | 187.3 | 47.6 | 3.0 |
| | 26-50 | 936.4 | 13.8 | 16.0 | 748.1 | 154.0 | 4.5 |
| | 51-75 | 1,630.4 | 3.5 | 20.2 | 1,397.2 | 202.3 | 7.1 |
| | 76+ | 2,564.3 | 5.6 | 35.4 | 2,259.7 | 255.6 | 8.0 |
| | Total | 5,377.2 | 22.9 | 79.8 | 4,592.3 | 659.5 | 22.6 |

---

[1] Table may not add to totals due to rounding. Includes data from 1979 and 1980 for the Superior and Chippewa National Forests, respectively.

Raile, Gerhard K; Hahn, Jerold T.
The extent and characteristics of low productivity aspen areas in Minnesota. Resour. Bull. NC-61. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 36 p.

Plot data from the 1977 Minnesota forest inventory were used to evaluate the productivity of Minnesota's aspen forest. Computer simulation was used to develop equations for evaluating the current and potential productivity of aspen forest stands. The analysis showed that 49 percent of the State's aspen forest type was producing less than half of potential volume yields.

KEY WORDS: *Populus,* inventory, timber supply, potential yields, stocking.

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# Timber Resource of Michigan's Northern Lower Peninsula, 1980

Pamela J. Jakes

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Information contained in this report includes the most commonly used Resources Evaluation statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complex retrieval involving the services of a Resources Evalution computer programmer. If requests for data conflict with ongoing Resources Evaluation work, requests will be scheduled so as to minimize the impact on the work unit.

Requests for unpublished information may be directed to:

Burton L. Essex
Renewable Resources Evaluation Project
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108

Phone: (612) 642-5282

Area served: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, Wisconsin.

**North Central Forest Experiment Station**
**Forest Service—U. S. Department of Agriculture**
**1992 Folwell Avenue**
**St. Paul, Minnesota 55108**
**Manuscript approved for publication October 29, 1981**
**1982**

# FOREWORD

Resources Evaluation (formerly called Forest Survey) is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual states. The North Central Forest Experiment Station is responsible for Resources Evaluation work done in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1980 Northern Lower Peninsula forest inventory was begun in January 1980 and was completed in January 1981. Reports on the three previous surveys of Michigan's timber resource are dated 1935, 1955, and 1966. Similar Resource Bulletins reporting statistical highlights and detailed tables on the other Survey Units in Michigan (see cover) are or soon will be available. In addition to these statistical reports, a series of analytical reports will also be published.

More accurate survey information was obtained during the 1980 survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding and field personnel provided the North Central Station through the Michigan Department of Natural Resources and by interested forest industry members. Data from the Department's canvass of all primary wood-using plants in the State was used to help estimate the quantity of timber products harvested in Michigan.

Aerial photos used in the Northern Lower Peninsula Forest Inventory were furnished by the Michigan Department of Natural Resources and the USDA Agricultural Stabilization and Conservation Service.

# CONTENTS

*Page*
Highlights ........................................ 1
Appendix ........................................ 3
  Accuracy of Survey ........................................ 3
  Survey Procedures ........................................ 3
  Comparing Michigan's Fourth Inventory with the Third Inventory ........................................ 4
  Log Grade ........................................ 5
  Tree Species Groups in Michigan's Northern Lower Peninsula Unit ........................................ 9
  Metric Equivalents of Units Used in this Report ........................................ 9
  Definition of Terms ........................................ 9
  Tables ........................................ 18

# TIMBER RESOURCE OF MICHIGAN'S NORTHERN LOWER PENINSULA, 1980

**Pamela J. Jakes**, *Resource Analyst*

## HIGHLIGHTS

### Forest Area

- Forest land accounted for 6.9 million acres (61 percent of the Unit's land area) in 1980, compared to 7.0 million acres (62 percent) in 1966.

- Commercial forest land occupied 6.7 million acres (97 percent of the forest land) in 1980, compared to 7.0 million acres (99 percent) in1966—a 4-percent decline.

- Productive-reserved forest land totaled 147,000 acres in 1980, compared to 62,100 acres in 1966. Additions since 1966 include the Sleeping Bear National Lakeshore, military reservations, State sharptail grouse management areas, and State Parks.

- Cheboygan County contained the largest area of commercial forest in 1980 (366,600 acres) as it did in 1966 (337,200 acres).

- Farmers and miscellaneous private individuals owned 3.4 million acres (51 percent of the commercial forest) in 1980, compared to 4.1 million acres (59 percent) in 1966.

- The aspen, maple-birch, and oak-hickory forest types continue to dominate the commercial forest land base in 1980 as they did in 1966.

- More than one-third of the privately-owned commercial forest has been owned by its present owner 20 years or more.

- Poletimber stands occupied 47 percent of the commercial forest in 1980 as compared to 51 percent in 1966.

- Sawtimber stands—the area of which increased by 288,400 acres between surveys—amounted to 22 percent of the commercial forest in 1980, compared to 17 percent in 1966.

### Timber Volume

- The volume of growing stock in 1980 was 6.8 billion cubic feet, 38 percent more than the 4.9 billion[1] in 1966.

- Sawtimber volume amounted to 15.1 billion board feet[2] in 1980.

- The 5.1 billion cubic feet of hardwoods make up 75 percent of the growing-stock volume.

- The maples (1.4 billion cubic feet), aspens (1.3 billion), and oaks (1.2 billion) contain the highest volumes and together account for more than half of the growing-stock volume.

- Average growing-stock volume per acre in 1980 was 1,019 cubic feet, compared to 707 cubic feet in 1966.

- Thirty-four percent of the growing-stock volume is in stands aged 41 to 60.

- Nearly three-quarters of the sawtimber volume is in grade 3 saw logs.

- The volume in cull trees (rough, rotten, and short-log cull) is 453 million cubic feet; salvable dead tree volume is 230 million cubic feet.

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[1] *Published 1966 volumes were adjusted by factors derived from 1980 volume equations to make volumes for the two inventories comparable.*

[2] *International ¼-inch rule.*

## Stand Conditions

- Net annual growth on growing-stock trees was 263 million cubic feet in 1979, compared to 196 million in 1965.
- The net annual growth rate of growing stock was 3.9 percent of inventory in 1979, compared to 4.0 percent in 1965.
- Net growth averaged 39.3 cubic feet per acre in 1979—28.0 cubic feet per acre in 1965.
- Annual mortality of growing stock amounted to 52 million cubic feet (0.8 percent of inventory) in 1979, compared to 25 million (0.5 percent of inventory) in 1965.
- Disease accounted for 34 percent of the mortality in 1979—chiefly diseases of aspen and elm.
- Fifty-five percent of the commercial area can grow trees 61 feet and taller at age 50, and 31 percent of the area can grow trees 71 feet and taller at the same age.
- Stands aged 50 or less declined from 70 percent of the commercial area in 1966 to 54 percent in 1980.

## Timber Use

- Timber removals from growing stock in 1979 totaled nearly 105 million cubic feet (1.5 percent o inventory), compared to 78 million cubic feet (1.6 percent of inventory) in 1965.
- The aspens made up 43 percent of the 1979 removals volume, although they accounted for only 19 percent of the growing-stock volume.
- Output of roundwood products totaled 106 million cubic feet in 1978; 43 percent of this output was pulpwood and 37 percent was saw logs.
- Wood residue from primary plants totaled 17 million cubic feet in 1978, of which 3 million were not used.

## Biomass

- Live tree biomass (trees more than 1 inch in d.b.h.) totaled 369 million green tons (55 tons per acre) in 1980, more than one half in the boles of growing-stock trees.
- Live shrub biomass (including trees less than 1 inch in d.b.h.) was highest in the tamarack forest type where it amounted to 1.6 tons per acre (green weight) in 1980.

# APPENDIX

## ACCURACY OF SURVEY

Resources Evaluation information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are estimates only. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the Northern Lower Peninsula Unit in 1980, 6,824.7 million cubic feet, has a sampling error of ± 1.21 percent (± 82.6 million cubic feet). The growing-stock volume from a 100-percent inventory, then, would be expected to fall between 6,742.1 and 6,907.3 million cubic feet (6,824.7 ± 82.6), there being a one in three chance that this is not the case. Sampling errors were calculated separately for National Forest land and other land because of the difference in the way the inventories were conducted. For example, the sampling error for growing-stock volume on land other than National Forest is ± 1.31 percent but for Huron National Forest land it is ± 5.54 percent and for the Manistee ± 3.53. Different survey procedures resulted in different sampling errors.

The following tabulation shows the combined sampling errors for the 1980 Northern Lower Peninsula Forest Inventory:

| Item | Unit totals | Sampling error |
|---|---|---|
| Growing stock | (Million cubic feet) | (Percent) |
| Volume | 6,824.7 | 1.21 |
| Growth | 263.0 | 1.67 |
| Removals | 104.5 | 13.40 |
| Sawtimer | (Million board feet) | |
| Volume | 15,082.2 | 1.90 |
| Growth | 903.3 | 2.88 |
| Removals | 325.3 | 15.50 |
| Commercial forest land | (Thousand acres) | |
| Area | 6,694.9 | 0.53 |

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for growing-stock volume in a particular county is higher than that for total growing-stock volume in the Survey Unit (table 74 shows the sampling errors for estimates smaller than Unit totals).

## SURVEY PROCEDURES

The major steps in the survey of the Northern Lower Peninsula Unit were as follows:

1. A total of 56,382 1-acre points were systematically distributed across aerial photos of the entire Unit, except the Huron and Manistee National Forests. These points were classified into land classes as shown below, in order to make a preliminary estimate of forest area. Next, a total of 32,804 of these points were stereoclassified as to forest type, stand-size class, and density. Finally, a total of 4,579 points were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken.

| Land class | Photo points | | Ground plots visited |
|---|---|---|---|
| | Classified | Stereoclassified | |
| Forest land | 32,502 | 32,502 | 2,617 |
| Unproductive forest land | 0 | 0 | 0 |
| Nonforest land | | | |
| with trees | 840 | 68 | 68 |
| without trees | 20,748 | 0 | 1,699 |
| water | 2,058 | 0 | 159 |
| Questionable | 234 | 234 | 36 |
| Total | 56,382 | 32,804 | 4,579 |

At each of forest ground plot location, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre. Tree measurements made at these locations and at 293 plots established in 1966 and remeasured in 1980 were the basis for estimates of timber volume, growth, mortality, number of trees, and other forest classifications on land other than National Forest land. Estimates for National Forest land were based on 270 plots established in 1976-1977 by National Forest personnel on commercial forest land on the Huron and Manistee.

2. Growth and mortality on all commercial forest land were estimated using the Stand and Tree Evaluation and Modeling System (STEMS)[3] after the System was adjusted with factors derived from the remeasurement in 1979 of permanent sample plots in the Northern Lower Peninsula that were initially established in 1965. STEMS is an individual tree-growth projection system that uses the following stand and tree characteristics to "grow" trees by updating tree diameter and tree status (live, dead, or cut): species, tree diameter, crown ratio, site index, basal area, and average stand diameter. These characteristics were used to produce growth and mortality rates that were adjusted based on ground conditions gained from remeasurement of plots and applied to trees on the tree list to yield an updated tree list. Local volume equations were applied to the original and updated tree lists to estimate volumes of growth and mortality.

3. The Huron and Manistee National Forests provided estimates of commercial forest area by forest type, stand-size class and stand density from the 1976-1977 National Forest Surveys and estimates of annual growing-stock removals since the last survey. These data were updated with STEMS to provide estimates of 1979 net annual growth and removals and 1980 volume for the Forests. National Forest personnel reviewed STEMS projections.

4. Statistics on timber utilization during 1978 were obtained from mill surveys. The Michigan Department of Natural Resources canvassed resident sawmills, veneer mills, and other primary wood-using plants. The North Central Forest Experiment Station canvassed out-of-State sawmills, pulpmills, and veneer mills to determine their use of Michigan timber. Fuelwood and fencepost output was based on a sample of public and private landowners to determine their production of fuelwood and fenceposts, and on a canvass of industrial and public timber owners. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Michigan primary wood-using plants. Timber cut for products by ownership class was determined by a canvass of public and industrial timber owners. The portion of timber cut unaccounted for by the latter owners was grouped under "farmer and other owners".

5. A total of 2,239 felled trees on 123 active logging operations were measured throughout the State during 1977-1978 to develop wood utilization factors for converting timber products output to timber removals for saw logs and pulpwood. Factors for all other products were obtained during the 1964-1965 Michigan utilization study.

6. Field data were sent to St. Paul for compilation.

# COMPARING MICHIGAN'S FOURTH INVENTORY WITH THE THIRD INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for each Forest Survey Unit in Michigan to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

## Identifying and Correcting Definitional or Procedural Changes

In Michigan's Northern Lower Peninsula Unit, changes between the 1966 and 1980 inventories included definitional changes in the ownership classes and productive-reserved forest land and procedural changes in determining the area of nonforest land by land class, the number of trees by 2-inch diameter class, and the volume equations.

In 1966, State Forest was a separate ownership class and included only land on State Forests. Other forested State-owned land was included under the Other Public ownership class. In 1980, the State ownership class included all State land. However, there is little State-owned commercial forest land outside the State Forest areas in the Northern Lower Peninsula, and general comparisons may be made between the 1966 and 1980 State estimates.

In 1966, some mining companies were called diversified forest industry and classed under Forest Industry. In 1980 these companies were classed under Miscellaneous Private Corporation. Therefore, to compare statistics for Forest Industry owner between 1966 and 1980 the reader must combine Forest Industry and Miscellaneous Private Corporation ownerships in 1980.

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[3] *For more information on STEMS, see: Belcher, D. L.; Holdaway, M. R.; Brand, G. J. A Description of STEMS: The stand and tree evaluation and modeling System. Gen. Tech. Rep. NC-79. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; (In prep.) p.*

During the 1966 Forest Inventory, Christmas tree plantations were classified as commercial forest land, but they are now classified as productive-reserved forest land. The 1966 commercial forest and productive-reserved areas were adjusted so that they are comparable to 1980 estimates.

In the 1966 Forest Inventory, the 1964 Census of Agriculture estimates of cropland and pasture and rangeland areas were used in our inventory report tables. The 1980 inventory estimates of cropland and pasture and rangeland came from aerial photointerpretation done by Resources Evaluation personnel. The published 1966 estimates of cropland and pasture and rangeland areas were adjusted to be compatible with 1980 estimates.

The procedures used to determine the number of growing-stock trees by species group and 2-inch diameter class improved between the 1966 and 1980 forest inventories. The procedure used in 1966 overestimated the number of growing-stock trees, especially in the lower diameter classes. The 1966 estimates were adjusted so that differences between 1966 and 1980 represent actual changes in the resource, not changes in procedures. Additional adjustments were made in the 1966 number of growing-stock trees to reflect the transfer of Christmas tree plantations to productive-reserved forest land.

The volume equations used in 1980 gave more accurate estimates of tree volume than those used in 1966. Therefore, the 1966 volumes were adjusted by factors derived from the 1980 volume equations to make them comparable to 1980 volumes.

## Running a Consistency Check

The Timber Resource Analysis System (TRAS) was used to ensure that it was possible to move from the adjusted 1966 resource statistics to the 1980 values. TRAS is a Forest Service computer program for updating, backdating, and projecting timber volume, growth, mortality, and removals. Using the adjusted 1966 numbers of softwood and hardwood trees by 2-inch diameter class and applying 1980 cubic feet per tree TRAS generated estimates of 1966 softwood and hardwood volumes that are comparable with 1980 volumes. Then, using growth rates, mortality rates, and removals rates for the period between the two surveys, TRAS moved from 1966 to 1980. The program printed out volumes by diameter class and softwoods and hardwoods for each year in the period. Thus, inconsistencies in volume, growth, mortality, and removals could be identified and resolved.

TRAS generated an estimate of what total removals had to be in order for the inventory to have changed as it did between surveys, given the volume, growth, and mortality inputs. Estimates for removals for products and for logging residues—two of the three components of total timber removals—were available from an independent utilization study. "Other" removals (see Definition of Terms in Appendix), the third component of total removals, were estimated by subtracting the first two removals components from the TRAS-generated total removals estimate. This estimate of "other" removals was compared with findings from remeasurement plots and new plots (stump counts and land use change) to check its validity. When necessary, TRAS was rerun and adjusted until other removals were compatible with the estimate from field data. Total removals are "trend level removals" because the estimate of "other" removals was based on a removals trend line from 1966 to 1980.

## LOG GRADE

In Michigan's Northern Lower Peninsula the butt log of every sawtimber tree on every full permanent sample plot was graded for quality. Additionally, all of the logs in a smaller sample of trees throughout the State were graded. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire Unit.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber".[4] The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

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[4] *Vaughn, C. L.; Wollin, C. A.; McDonald, K. A.; and Bulgrin, E. H. Hardwood log grades for standard lumber. Res. Pap. FPL 63. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory; 1966. 52 p.*

# Forest Service standard grades for hardwood factory saw logs

| Grading factors | | Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Log grade 1 | | | Log grade 2 | | | | Log grade 3 |
| Position in tree | | Butts only | Butts and uppers | | Butts and uppers | | | | Butts and uppers |
| Scaling diameter, inches | | [1]13-15 | 16-19 | 20+ | [2]11+ | 12+ | | | 8+ |
| Length without trim, feet | | 10+ | | | 10+ | 8-9 | 10-11 | 12+ | 8+ |
| Required clear cuttings[3] of each of three best faces[4] | Min. length, feet | 7 | 5 | 3 | 3 | 3 | 3 | 3 | 2 |
| | Max. number | 2 | 2 | 2 | 2 | 2 | 2 | 3 | No Limit |
| | Min. proportion of log length required in clear cutting | 5/6 | 5/6 | 5/6 | 3/4 | 3/4 | 2/3 | 2/3 | 1/2 |
| Maximum sweep and crook allowance | For logs with less than one-fourth of end in sound defects | 15 percent | | | 30 percent | | | | 50 percent |
| | For logs with more than one-fourth of end in sound defects | 10 percent | | | 20 percent | | | | 35 percent |
| Maximum scaling deduction | | 40 percent[5] | | | 50 percent[6] | | | | 50 percent |

[1] Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.

[2] Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.

[3] A clear cutting is a portion of a face, extending the width of the face, that is free of defects.

[4] A face is one-fourth of the surface of the log as divided lengthwise.

[5] Otherwise #1 logs with 41-60 percent deductions can be #2.

[6] Otherwise #2 logs with 51-60 percent deductions can be #3.

# Forest Service standard specifications for hardwood construction logs (tie and timber logs)[1]

| | | |
|---|---|---|
| Position in tree | | Butt and upper |
| Min. diameter, small end | | 8 inches + |
| Min. length, without trim | | 8 feet |
| Clear cuttings | | No requirements |
| Sweep allowance, absolute | | One-fourth of the diameter at the small end for each 8 feet of length. |
| Sound surface defects | Single knots | Any number, if no one knot has an average diameter above the callus in excess of one-third of the log diameter at point of occurrence. |
| | Whorled knots | Any number if sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence. |
| | Holes | Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber.[2] |
| Unsound surface defects | | Same requirements as for sound defects if they extend into included timber.[2] No limit if they do not. |
| End defects | Sound | No requirements. |
| | Unsound | None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit a longitudinal split not extending more than 5 inches into the contained timber. |

[1] These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, then it may be necessary to subdivide the class into grades.

[2] Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications on the next page.

# Log Grades for Eastern White Pine

| Log grade | Minimum size Diameter | Minimum size Length[1] | Sweep or crook allowance | Total cull allowance including sweep | Maximum weevil injury | Allowable knot size (inches)[2] on three best faces or minimum clearness on four faces |
|---|---|---|---|---|---|---|
| | Inches | Feet | Percent | | Number | Inches |
| 1 | 12 & 13 | 8-16 | 20 | 50 | 0 | Four faces clear full length |
| | 14 + | 10-16 | 20 | 50 | 0 | Two faces clear full length, or four faces clear 50 percent length (6 foot min. length)[3] |
| 2 | 6 + | 8-16 | 30 | 50 | 0 | Sound knots 1.e[4]<br>D/6 and less than 3 inches.[5]<br>Unsound knots: 1.e. 1½ inches and for: butt, lots 1.e. D/12, upper logs 1.e. D/10, or four faces clear 50 percent of length |
| 3 | 6 + | 8-16 | 40 | 50 | 8-foot logs 1 weevil<br>10-foot + logs: 2 weevils | Sound knots 1.e.D/3 and less than 5 inches<br>Unsound knots 1.e. D/6 and less than 2½ inches. |
| 4 | 6 + | 8-16 | 50 | 50 | No limit | No limit |

[1] Plus trim.
[2] Disregard all knots less than inch diameter in all grades.
[3] The sum of the diameter of sound knots plus twice the sum of the diameter of unsound knots (in inches) is less than or equal to half of the diameter of the log (inches).
[4] 1.e. means less than or equal to.
[5] D means d.i.b. of log at location of knot.

# Log Grades for Jack Pine and Red Pine

*Grade 1:* logs with three or four clear faces.[5]

*Grade 2:* logs with one or two clear faces.

*Grade 3:* logs with no clear faces.

After the tentative log grade is established, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one third the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log grade if conk, massed hyphae, or other evidence of advanced heart rot is found anywhere in it.

# Log Grades For All Other Softwood Logs

**Grade 1**

1. Logs must be 16 inches in diameter or larger, 10 feet in length or longer, and have not more than 30 percent of gross scale deducted for defect.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not more than 2-inches in size.

**Grade 2**

1. Logs must be 12 inches in diameter or larger, 10 feet in length or longer, and have a net scale of at least 50 percent of the gross contents of the log after deduction for defect.
2. Logs must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

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[5] *A face is one fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than ½-inch in diameter, overgrown knots of any size, holes more than ¼-inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.*

**Grade 3**

1. Logs must be 6 inches in diameter or larger, 8 feet in length or longer, and have a net scale of at least 50 percent of the gross contents of the log after deduction for defect.

Note: (A) Diameters are diameter inside bark (d.i.b.) at small end of log.
(B) Percent clear refers to percent clear in one continuous section.

## TREE SPECIES GROUPS IN MICHIGAN'S SOUTHERN LOWER PENINSULA UNIT[6]

| | |
|---|---|
| SOFTWOODS | |
| Eastern white pine | *Pinus strobus* |
| Red pine | *Pinus resinosa* |
| Jack pine | *Pinus banksiana* |
| White spruce | *Picea glauca* |
| Black spruce | *Picea mariana* |
| Balsam fir | *Abies balsamea* |
| Eastern hemlock | *Tsuga canadensis* |
| Tamarack | *Larix laricina* |
| Northern white-cedar | *Thuja occidentalis* |
| OTHER SOFTWOODS | |
| Eastern redcedar | *Juniperus virginiana* |
| Norway spruce | *Picea abies* |
| Austrian pine | *Pinus nigra* |
| Scotch pine | *Pinus sylvestris* |
| HARDWOODS | |
| White oaks | |
| White oak | *Quercus alba* |
| Swamp white oak | *Quercus bicolor* |
| Bur oak | *Quercus macrocarpa* |
| Chestnut oak | *Quercus prinus* |
| Select red oak | |
| Northern red oak | *Quercus rubra* |
| Other red oak | |
| Scarlet oak | *Quercus coccinea* |
| Northern pin oak | *Quercus ellipsoidalis* |
| Pin oak | *Quercus palustris* |
| Black oak | *Quercus velutina* |
| Hickories | |
| Bitternut hickory | *Carya cordiformis* |
| Pignut hickory | *Carya glabra* |
| Shellbark hickory | *Carya laciniosa* |
| Shagbark hickory | *Carya ovata* |
| Mockernut hickory | *Carya tomentosa* |
| Yellow birch | *Betula alleghaniensis* |
| Hard maples | |
| Sugar maple | *Acer saccharum* |
| Black maple | *Acer nigrum* |
| Soft maples | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| American beech | *Fagus grandifolia* |
| Ashes | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Balsam poplar | *Populus balsamifera* |
| Eastern Cottonwood | *Populus deltoides* |
| Aspens | |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| Basswood | *Tilia americana* |
| Yellow poplar | *Liriodendron tulipifera* |
| Black walnut | *Juglans nigra* |
| Black cherry | *Prunus serotina* |
| Butternut | *Juglans cinerea* |
| Elms | |
| American elm | *Ulmus americana* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomassii* |
| Paper birch | *Betula papyrifera* |
| OTHER HARDWOODS | |
| Boxelder | *Acer negundo* |
| River birch | *Betula nigra* |
| Black willow | *Salix nigra* |
| Ohio buckeye | *Aesculus glabra* |
| Flowering dogwood | *Cornus florida* |
| Honey locust | *Gleditsia triacanthos* |
| Osage-orange | *Maclura pomifera* |
| Black tupelo | *Nyssa sylvatica* var. *sylvatica* |
| Sycamore | *Platanus occidentalis* |
| Black locust | *Robinia psuedoacacia* |
| Sassafras | *Sassafras albidum* |

## METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International ¼-inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilogram.
1 ton = 0.907 metric ton.

## DEFINITION OF TERMS

**Acceptable trees.**—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

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[6] *The common and scientific names are based on, Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handbk. 541. Washington, D.C.: U.S. Department of Agriculture, Forest Service, 1979. 375 p.*

**Area-condition classes.**—*Class 10.*—Areas fully stocked with desirable trees but not overstocked.

*Class 20.*—Areas fully stocked with desirable trees but overstocked with all live trees.

*Class 30.*—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

*Class 40.*—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

*Class 50.*—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

*Class 60.*—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

*Class 70.*—Areas poorly stocked with desirable trees and poorly stocked with growing-stock trees.

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Biomass.**—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of 5 components:

*Growing-stock bole.*—Biomass of a growing-stock tree from a 1-foot stump to a variable 4-inch top.

*Growing-stock tops and limbs.*—Biomass of a growing-stock tree from a 1-foot stump minus the growing-stock bole.

*Cull bole.*—Biomass of a cull tree from a 1-foot stump to a variable 4-inch top.

*Cull tops and limbs.*—Biomass of a cull tree from a 1-inch stump minus the cull bole.

*1- to 5-inch trees.*—Biomass of all live trees 1- to 5-inches in diameter at breast height.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

**County and municipal land.**—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

**Cull.**—Portions of a tree that are unusable for industrial wood products, because of rot, form, or other defect.

**Desirable trees.**—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

**Diameter classes.**—A classification of trees based on diameter outside bark, measured at breast height (4- feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Survey, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h. inclusive).

**Farm.**—Either a place operated as a unit of 10 or more acres from which the sale of agricultural products totals $50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least $250. Places having less than the $50 or $250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce goods in sufficient quantity to meet the requirements of the definition.

**Farmer-owned land.**—Land owned by farm operators. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest trees.**—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

**Forest type.**—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Michigan are:

*Jack pine.*—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

*Red pine.*—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

*White pine.*—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

*Balsam fir.*—Forests in which balsam fir and white spruce comprise a plurality of stocking with balsam fir the most common. (Common associates include white spruce, aspen, maple, birch, northern white-cedar, and tamarack.)

*White spruce.*—Forests in which white spruce and balsam fir comprise a plurality of the stocking with white spruce the most common. (Common associates include balsam fir, aspen, maple, birch, northern white-cedar, and tamarack.)

*Black spruce.*—Forests in which swamp conifers comprise a plurality of the stocking with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

*Northern white-cedar.*—Forests in which swamp conifers comprise a plurality of the stocking with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

*Tamarack.*—Forests in which swamp conifers comprise a plurality of the stocking with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

*Oak-hickory.*—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, beech, yellow-poplar, elm, and maple.)

*Elm-ash-soft maple.*—Forests in which lowland elm, ash, cottonwood, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include birches, spruce, and balsam fir.)

*Maple-birch.*—Forests in which sugar maple, basswood, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, hemlock, and basswood.)

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

*Paper birch.*—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

*Exotic.*—Forests in which species not native to Michigan comprise a plurality of the stocking. (Mostly scotch pine plantations.)

**Gross area.**—The entire area of land and water as determined by the Bureau of the Census, 1970.

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by multiplying by 79 cubic feet per solid wood cord.

**Hardwoods.**—Dicotyledonous trees, usually broad-leaved and deciduous.

**Idle farmland.**—Includes former croplands, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

**Improved pasture.**—Land currently improved for grazing, by cultivation, seeding, irrigation, or clearing of trees or brush and less than 16.7 percent stocked with live trees.

**Indian land.**—Tribal lands held in fee but administered by the Federal Government.

**Land area.**—A. *Bureau of the Census.* The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Survey.* The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Live trees.**—Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

**Log grades.**—A classification of logs based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

**Logging residues.**—The unused growing stock portions of trees cut or killed by logging.

**Maintained road.**—Any road, hard-topped or other surfaces, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

**Marsh.**—Nonforest land that characteristically supportslow, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

**Merchantable.**—Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

**Miscellaneous Federal land.**—Federal land other than National Forest, and land administered by the Bureau of Land Management.

**Miscellaneous private land.**—Privately owned land other than forest-industry and farmer-owned land.

**Mortality.**—The volume of sound wood in growing-stock and sawtimber trees that die annually.

**National Forest land.**—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

**Net annual growth of growing-stock.**— The annual change in volume of sound wood in live-sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

**Net annual growth of sawtimber.**—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

**Net volume.**—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land.

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area, to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Other removals.**—Growing-stock trees removed but not utilized for products, or trees left standing but "removed" from the commercial forest land classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

**Ownership.**—Property owned by one owner, regardless of the number of parcels in a specified area.

**Ownership size class.**—The amount of commercial forest land owned by one owner, regardless of the number or parcels.

**Owner tenure.**—The length of time a property has been held by the owner.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Resources Evaluation inventories are:

*Xeric sites.*—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

**Plant byproducts.**—Plant residues used for products such as mulch, pulp chips, and fuelwood.

**Plant residues.**—Wood and bark materials generated at manufacturing plants during production of other products.

**Poletimber stands.**—(See stand-size class.)

**Poletimber trees.**—Growing-stock trees of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten trees.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough trees.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Roundwood products.**—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs, veneer logs and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

**Salvable dead trees.**—Standing or down dead trees that are considered merchantable by Regional standards.

**Saplings.**—Live trees 1.0 to 5.0 inches d.b.h.

**Sapling-seedling stands.**—(See stand-size class.)

**Saw log.**—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by Regional standards.

**Saw log portion.**—That part of the bole of sawtimber trees between the stump and the saw log top.

**Saw log top.**—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

**Sawtimber stands.**—(See stand-size class.)

**Sawtimber trees.**—Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting Regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

**Sawtimber volume.**—Net volume of the saw log portion of live sawtimber in board feet, International inch rule, from stump to a minimum 7 inches top diameter outside bark (d.o.b.) for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

**Seedlings.**—Live trees less than 1.0 inch d.b.h. that areexpected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Short-log (rough tree).**—Sawtimber-size trees of commercial species that contain at least one merchantable 8-to 11-foot saw log but not a 12-foot saw log.

**Shrub biomass.**—The total above-ground weight (including the bark) of selected shrubs and trees less than 1 inch d.b.h.

**Site class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-area class.**—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

**Stand-size class.**—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings.

a. *Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

b. *Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

c. *Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

d. *Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

**State land.**—Land owned by States, or land leased to these governmental units for 50 years or more.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Timber removals from growing stock.**—The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals.

**Timber removals from sawtimber.**—The net board-foot volume of live sawtimber trees removed for forest products annually (including roundwood products and logging residues) and for other removals.

**Timber products output.**—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

**Tree biomass.**—The total aboveground weight (including the bark) of all trees 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark) from a 1-foot stump for trees more than 5 inches in diameter.

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

**Upper stem portion.**—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

**Urban and other areas.**—Areas within the legal boundaries of cities andtowns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards, cemeteries, roads; railroads; airports; beaches; powerlines; and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

**Wooded strip.**—An acre or more of natural continuous forest land that would otherwise meet survey standards for commercial forest land except that it is less than 120 feet wide.

# TABLES

## AREA

Table 1.— Area of land by land class, 1966 and 1980

Table 2.— Area of land by land use class and county

Table 3.— Area of commercial forest land by ownership class and county

Table 4.— Area of commercial forest land by forest type, physiographic class, and ownership class

Table 5.— Area of commercial forest land by ownership class and site class

Table 6.— Area of commercial forest land by ownership class and stand-volume class

Table 7.— Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner

Table 8.— Area of commercial forest land by forest type, stand-size class, and ownership class

Table 9.— Area of commercial forest land by forest type and county

Table 10.— Area of commercial forest land by county and stand-size class

Table 11.— Area of commercial forest land by forest type, stand-size class, and site class

Table 12.— Area of commercial forest land by forest type and stand-age class

Table 13.—Area of commercial forest land by forest type and site-index class

Table 14.—Area of commercial forest land by forest type, stand-size class, and basal-area class

Table 15.—Area of commercial forest land by stocking class of growing-stock trees and stand-size class

Table 16.—Area of commercial forest land by stocking class based on selected stand components

Table 17.—Area of noncommercial forest land by ownership class

Table 18.—Area of noncommercial forest land by forest type

Table 19.—Area of nonforest land with trees by forest type and land use

## NUMBER OF TREES

Table 20.—Number of all live trees on commercial forest land by species group and diameter class

Table 21.—Number of growing-stock trees on commercial forest land by species group and diameter class

Table 22.—Number of short-log trees on commercial forest land by species group and diameter class

## VOLUME

Table 23.—Net volume of growing stock on commercial forest land by species, 1966 and 1980

Table 24.—Net volume of all live trees on commercial forest land by species group and diameter class

Table 25.—Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods

Table 26.—Net volume of growing-stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individua species.

Table 27.—Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species

Table 28.—Net volume of growing stock on commercial forest land by county and species group

Table 29.—Net volume of sawtimber on commercial forest land by county and species group

Table 30.—Net volume of growing stock on commercial forest land by species group and diameter class

Table 31.—Net volume of sawtimber on commercial forest land by species group and diameter class

Table 32.—Net volume of growing stock on commercial forest land by species group and forest type

Table 33.—Net volume of sawtimber on commercial forest land by species group and forest type

Table 34.—Net volume of growing stock on commercial forest land by species group and ownership class

Table 35.—Net volume of sawtimber on commercial forest land by species group and ownership class

Table 36.—Net volume of growing stock on commercial forest land by forest type and stand-age class

Table 37.—Net volume of sawtimber on commercial forest land by forest type and stand-age class

Table 38.—Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 39.—Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 40.—Net volume of sawtimber on commercial

forest land by species group and log-grade class

Table 41.—Net volume of short-log trees on commercial forest land by species group and diameter class

Table 42.—Net volume of short-log trees on commercial forest land by species group and diameter class

## GROWTH AND REMOVALS

Table 43.—Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, 1965-1979

Table 44.—Net annual growth of growing stock on commercial forest land by species group and county

Table 45.—Net annual growth of sawtimber on commercial forest land by species group and county

Table 46.—Net annual growth of growing stock on commercial forest land by species group and ownership class

Table 47.—Net annual growth of sawtimber on commercial forest land by species group and ownership class

Table 48.—Net annual growth of growing stock on commercial forest land by species group and forest type

Table 49.—Net annual growth of sawtimber on commercial forest land by species group and forest type

Table 50.—Net annual growth of growing stock on commercial forest land by forest type and stand-age class

Table 51.—Net annual growth of sawtimber on commercial forest land by forest type and stand-age class

Table 52.—Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 53.—Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 54.—Timber removals from growing-stock on commercial forest land by species group and county

Table 55.—Timber removals from sawtimber on commercial forest land by species group and county

Table 56.—Timber removals from growing stock and sawtimber on commercial forest land by species group, 1965 and 1979

Table 57.—Timber removals from growing stock and sawtimber on commercial forest land by item and species category

Table 58.—Net annual growth and removals of growing stock on commercial forest land by species group

Table 59.—Net annual growth and removals of sawtimber on commercial forest land by species group

Table 60.—Net annual growth and removals of growing stock on commercial forest land by ownership class and softwoods and hardwoods

Table 61.—Net annual growth and removals of sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## MORTALITY

Table 62.—Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, 1965 and 1979

Table 63.—Annual mortality of growing stock on commercial forest land by species group and cause

Table 64.—Annual mortality of sawtimber on commercial forest land by species group and cause

Table 65.—Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## UTILIZATION

Table 66.—Output of timber products by source of material and softwoods and hardwoods

Table 67.—Output of roundwood products by source of material and softwoods and hardwoods

Table 68.—Timber products from roundwood by species group and product

Table 69.—Volume of primary plant residue by use and type

## BIOMASS

Table 70.—All live shrub biomass yields on commercial forest land by shrub species group and forest type

Table 71.—Live tree biomass yields on commercial forest land by species group and forest type

Table 72.—All live tree biomass on commercial forest land by species group and forest type

Table 73.—All live tree biomass by species group and tree biomass component

## SAMPLING ERRORS

Table 74.—Sampling errors for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land

Table 1.--Area of land by land class, Northern Lower Peninsula, Michigan, 1966[1] and 1980

(In thousand acres)

| Land class | 1966[1] | 1980 |
|---|---|---|
| FOREST LAND | | |
| Commercial forest | | |
| Jack pine | 467.1 | 506.7 |
| Red pine | 325.1 | 427.0 |
| White pine | 36.7 | 75.2 |
| Balsam fir-white spruce | 183.7 | 73.3 |
| Black spruce | 29.4 | 28.0 |
| Northern white-cedar | 333.8 | 355.5 |
| Tamarack | 35.9 | 30.6 |
| Oak-hickory | 1,252.0 | 1,068.1 |
| Elm-ash-soft maple | 604.4 | 416.3 |
| Maple-birch | 1,291.6 | 1,662.4 |
| Aspen | 1,998.6 | 1,817.5 |
| Paper birch | 174.0 | 113.9 |
| Exotic | 54.0 | 57.2 |
| Nonstocked | 168.8 | 63.2 |
| Subtotal | 6,955.1 | 6,694.9 |
| Noncommercial forest land | | |
| Unproductive | 34.5 | 87.7 |
| Productive-reserved | 62.1 | 147.0 |
| Subtotal | 96.6 | 234.7 |
| Total | 7,051.7 | 6,929.6 |
| NONFOREST LAND | | |
| Cropland | 1,956.8 | 2,603.2 |
| Pasture and range | 929.1 | 754.8 |
| Other | 1,449.8 | 1,063.1 |
| Total | 4,335.7 | 4,421.1 |
| TOTAL LAND | [2]11,387.4 | [3]11,350.7 |
| WATER (BUREAU OF THE CENSUS) | [2]325.9 | [3]362.6 |
| TOTAL LAND AND WATER | [2]11,713.3 | [3]11,713.3 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

[2] U.S. Department of Commerce, Bureau of Census. 1950.

[3] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 2.--Area of land by land use class and county, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Land use class | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| FOREST LAND |  |  |  |  |  |  |  |  |  |  |  |  |
| Commercial forest | 6,694.9 | 306.5 | 217.7 | 156.6 | 92.7 | 17.8 | 121.1 | 138.6 | 366.6 | 215.7 | 272.9 | 195.2 |
| Unproductive forest | 87.7 | 10.4 | 3.2 | -- | 1.7 | -- | -- | -- | 15.3 | 4.2 | 0.3 | -- |
| Productive reserved | 147.0 | 2.0 | 1.7 | 3.3 | -- | 2.3 | 9.9 | 0.5 | 1.1 | -- | 31.6 | 7.0 |
| Total | 6,929.6 | 318.9 | 222.6 | 159.9 | 94.4 | 20.1 | 131.0 | 139.1 | 383.0 | 219.9 | 304.8 | 202.2 |
| NONFOREST LAND |  |  |  |  |  |  |  |  |  |  |  |  |
| Nonforest with trees |  |  |  |  |  |  |  |  |  |  |  |  |
| Cropland with trees | 46.7 | -- | -- | 2.5 | -- | 4.5 | -- | -- | -- | 2.3 | -- | 2.5 |
| Improved pasture with trees | 62.3 | 4.5 | 4.6 | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- |
| Wooded strips | 33.8 | 2.3 | -- | 4.7 | -- | -- | -- | 9.6 | 5.1 | -- | -- | -- |
| Idle farmland with trees | 2.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh with trees | 97.8 | -- | 2.5 | -- | 2.3 | -- | 2.5 | 2.2 | -- | 11.8 | -- | -- |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Wooded pasture | 2.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.2 |
| Subtotal | 252.6 | 6.8 | 7.1 | 7.2 | 2.3 | 4.5 | 2.5 | 11.8 | 5.1 | 16.4 | -- | 4.7 |
| Nonforest without trees |  |  |  |  |  |  |  |  |  |  |  |  |
| Cropland without trees | 2,384.1 | 56.7 | 87.7 | 95.6 | 99.2 | 181.3 | 34.8 | 65.5 | 49.0 | 69.0 | 15.2 | 63.3 |
| Improved pasture without trees | 692.5 | 23.2 | 18.6 | -- | 2.3 | -- | 13.9 | -- | -- | 27.9 | 20.9 | -- |
| Idle farm without trees | 2.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh without trees | 166.7 | 16.4 | 4.8 | -- | 5.4 | 7.0 | 4.6 | 2.3 | 3.9 | 11.8 | 2.3 | -- |
| Other farm-farmstead | 172.4 | 2.3 | -- | 2.3 | -- | 4.6 | 5.8 | 2.3 | -- | 4.6 | 2.3 | 4.1 |
| Urban and other | 727.6 | 9.3 | 20.4 | 39.3 | 31.6 | 67.1 | 9.3 | 44.1 | 20.2 | 15.8 | 13.8 | 20.5 |
| Noncensus water | 22.7 | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- | -- | -- |
| Subtotal | 4,168.5 | 107.9 | 131.5 | 137.2 | 138.5 | 261.6 | 68.4 | 114.2 | 73.1 | 129.1 | 54.5 | 87.9 |
| Total | 4,421.1 | 114.7 | 138.6 | 144.4 | 140.8 | 266.1 | 70.9 | 126.0 | 78.2 | 145.5 | 54.5 | 92.6 |
| TOTAL LAND | [1]11,350.7 | 433.6 | 361.3 | 304.3 | 235.2 | 286.2 | 201.9 | 265.1 | 461.2 | 365.4 | 359.3 | 294.7 |
| WATER (BUREAU OF THE CENSUS) | [1]362.6 | 10.6 | 16.3 | 28.5 | 1.0 | 2.4 | 17.0 | 23.6 | 49.5 | 3.9 | 2.9 | 10.6 |
| TOTAL LAND AND WATER | [1]11,713.3 | 444.2 | 377.6 | 332.8 | 236.2 | 288.6 | 218.9 | 288.7 | 510.7 | 369.3 | 362.2 | 305.3 |

(Table 2 continued on next page)

[1] U.S. Department of Commerce, Bureau of the Census, 1970. Area Measurement Reports, GE-20, No. 1.

(Table 2 continued)

| | County | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land use class | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
| FOREST LAND | | | | | | | | | | | | |
| Commercial forest | 192.8 | 152.2 | 224.6 | 78.4 | 253.3 | 299.8 | 75.8 | 225.5 | 148.0 | 122.7 | 147.5 | 204.4 |
| Unproductive forest | -- | -- | 7.1 | -- | 2.5 | 0.2 | -- | -- | 0.1 | 2.5 | 2.3 | 2.3 |
| Productive reserved | 0.3 | 2.2 | 0.2 | -- | 19.5 | -- | 18.3 | 0.2 | 7.9 | -- | -- | 5.8 |
| Total | 193.1 | 154.4 | 231.9 | 78.4 | 275.3 | 300.0 | 94.1 | 225.7 | 156.0 | 125.2 | 149.8 | 212.5 |
| NONFOREST LAND | | | | | | | | | | | | |
| Nonforest with trees | | | | | | | | | | | | |
| Cropland with trees | -- | 2.3 | 2.3 | 2.3 | 2.3 | -- | -- | -- | -- | 4.8 | -- | 4.6 |
| Improved pasture with trees | -- | 2.3 | 2.3 | 7.2 | 2.3 | 2.3 | 2.3 | -- | 2.3 | 6.8 | -- | 2.3 |
| Wooded strips | -- | -- | -- | -- | 2.5 | -- | -- | -- | -- | -- | -- | 4.0 |
| Idle farmland with trees | -- | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh with trees | 10.9 | -- | -- | 6.8 | -- | -- | -- | 4.7 | -- | -- | -- | 10.5 |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | -- | -- | -- | -- | 2.5 | -- | -- | -- | -- | -- | -- | -- |
| Wooded pasture | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 10.9 | 4.6 | 6.9 | 16.3 | 9.6 | 2.3 | 2.3 | 4.7 | 2.3 | 11.6 | -- | 21.4 |
| Nonforest without trees | | | | | | | | | | | | |
| Cropland without trees | 62.7 | 65.0 | 36.8 | 189.6 | 56.5 | 23.2 | 68.8 | 74.3 | 119.2 | 139.3 | 111.5 | 70.2 |
| Improved pasture without trees | 39.5 | 29.0 | 25.8 | 42.7 | -- | 30.2 | 23.6 | 4.6 | 13.9 | 47.3 | 18.6 | 23.2 |
| Idle farm without trees | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.5 | -- | -- |
| Marsh without trees | 2.3 | 2.3 | 2.3 | 2.3 | -- | -- | .0 | 6.8 | -- | 6.9 | 4.6 | 13.8 |
| Other farm-farmstead | 2.3 | 7.0 | 14.1 | 4.6 | 4.6 | 2.3 | 7.8 | 10.0 | 11.1 | 4.6 | 18.6 | 9.3 |
| Urban and other | 11.4 | 33.5 | 28.5 | 30.4 | 12.2 | 7.3 | 23.9 | 27.8 | 9.3 | 21.0 | 29.6 | 9.3 |
| Noncensus water | -- | -- | 1.6 | 1.6 | 3.8 | -- | -- | -- | 1.6 | -- | -- | 1.6 |
| Subtotal | 118.2 | 136.8 | 109.1 | 271.2 | 77.1 | 63.0 | 124.1 | 123.5 | 155.1 | 221.6 | 182.9 | 127.4 |
| Total | 129.1 | 141.4 | 116.0 | 287.5 | 86.7 | 65.3 | 126.4 | 128.2 | 157.4 | 233.2 | 182.9 | 148.8 |
| TOTAL LAND | 322.2 | 295.8 | 347.9 | 365.9 | 362.0 | 365.3 | 220.5 | 353.9 | 313.4 | 358.4 | 332.7 | 361.3 |
| WATER (BUREAU OF THE CENSUS) | 5.5 | 17.8 | 12.4 | 0.8 | 4.7 | 4.0 | 18.9 | 9.6 | 9.8 | 6.4 | 2.0 | 4.8 |
| TOTAL LAND AND WATER | 327.7 | 313.6 | 360.3 | 366.7 | 366.7 | 369.3 | 239.4 | 363.5 | 323.2 | 364.8 | 334.7 | 366.1 |

(Table 2 continued on next page)

(Table 2 continued)

| | County | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Land use class | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| FOREST LAND | | | | | | | | | | |
| Commercial forest | 302.0 | 310.0 | 148.3 | 219.5 | 156.8 | 307.2 | 260.8 | 266.9 | 246.7 | 250.3 |
| Unproductive forest | -- | 4.3 | 5.1 | 9.4 | -- | 2.7 | -- | 7.7 | 6.0 | 0.4 |
| Productive reserved | 0.3 | 2.0 | 6.6 | 6.4 | 1.7 | -- | 2.1 | 3.0 | 0.1 | 11.0 |
| Total | 302.3 | 316.3 | 160.0 | 235.3 | 158.5 | 309.9 | 262.9 | 277.6 | 252.8 | 261.7 |
| NONFOREST LAND | | | | | | | | | | |
| Nonforest with trees | | | | | | | | | | |
| Cropland with trees | -- | 2.3 | 7.1 | -- | 2.4 | 2.2 | -- | -- | -- | 2.3 |
| Improved pasture with trees | -- | 2.4 | 2.4 | 4.6 | 2.3 | 2.2 | -- | -- | -- | 6.9 |
| Wooded strips | -- | -- | 3.4 | -- | -- | -- | -- | 2.2 | -- | -- |
| Idle farmland with trees | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh with trees | -- | 4.4 | 3.3 | 2.3 | 12.4 | -- | -- | 6.8 | 11.1 | 3.3 |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | -- | 2.6 | 2.4 | -- | -- | -- | -- | -- | -- | -- |
| Wooded pasture | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | 11.7 | 18.6 | 6.9 | 17.1 | 4.4 | -- | 9.0 | 11.1 | 12.5 |
| Nonforest without trees | | | | | | | | | | |
| Cropland without trees | 15.9 | 111.2 | 98.9 | 46.5 | 106.8 | 18.6 | 30.2 | 74.3 | 4.6 | 42.7 |
| Improved pasture without trees | 12.2 | 67.1 | 37.2 | 25.3 | 46.5 | 13.9 | 25.2 | 14.1 | 21.0 | 24.8 |
| Idle farm without trees | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh without trees | 6.2 | 5.0 | -- | 16.5 | 4.6 | 2.3 | 4.6 | 7.0 | 18.4 | 2.3 |
| Other farm-farmstead | 2.3 | 7.0 | 10.8 | 4.6 | 9.3 | 2.3 | -- | 4.6 | 2.3 | 4.6 |
| Urban and other | 16.3 | 23.4 | 17.7 | 23.3 | 29.0 | 7.2 | 14.6 | 28.0 | 23.2 | 9.3 |
| Noncensus water | -- | 2.0 | -- | 7.3 | -- | 1.6 | -- | -- | -- | -- |
| Subtotal | 52.9 | 215.7 | 164.6 | 123.5 | 196.2 | 45.9 | 74.6 | 128.0 | 69.5 | 83.7 |
| Total | 52.9 | 227.4 | 183.2 | 130.4 | 213.3 | 50.3 | 74.6 | 137.0 | 80.6 | 96.2 |
| TOTAL LAND | 355.2 | 543.7 | 343.2 | 365.7 | 371.8 | 360.2 | 337.5 | 414.6 | 333.4 | 357.9 |
| WATER (BUREAU OF THE CENSUS) | 7.7 | 11.2 | 3.0 | 5.5 | 2.6 | 3.3 | 6.8 | 19.3 | 33.3 | 6.9 |
| TOTAL LAND AND WATER | 362.9 | 554.9 | 346.2 | 371.2 | 374.4 | 363.5 | 344.3 | 433.9 | 366.7 | 364.8 |

Table 3.--Area of commercial forest land by ownership class and county,
Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| National Forest | 859.5 | 103.1 | -- | -- | -- | -- | -- | -- | -- | -- | 41.0 | -- |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 15.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| State | 1,825.1 | 2.0 | 26.9 | 39.6 | 25.2 | -- | 59.3 | 47.6 | 186.2 | 52.9 | 127.1 | 78.3 |
| County and municipal | 37.6 | -- | 2.5 | -- | -- | -- | -- | 2.2 | -- | 2.2 | -- | 2.5 |
| Forest industry | 76.0 | -- | -- | -- | -- | -- | 5.0 | -- | 11.9 | -- | 2.3 | -- |
| Farmer | 1,274.5 | 27.5 | 33.2 | 19.0 | 14.9 | 8.9 | 17.2 | 51.6 | 152.5 | 49.3 | 7.6 | 90.7 |
| Misc. private-corp. | 474.0 | 61.9 | 33.6 | 12.2 | 4.5 | -- | 4.5 | 7.2 | -- | 29.4 | 13.3 | 2.2 |
| Misc. private-indiv. | 2,133.1 | 112.0 | 121.5 | 85.8 | 48.1 | 8.9 | 35.1 | 30.0 | 16.0 | 81.9 | 81.6 | 21.5 |
| All owners | 6,694.9 | 306.5 | 217.7 | 156.6 | 92.7 | 17.8 | 121.1 | 138.6 | 366.6 | 215.7 | 272.9 | 195.2 |

(Table 3 continued)

(Table 3 continued)

| Ownership class | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
| National Forest | -- | -- | 96.6 | -- | -- | 108.1 | -- | 64.5 | 51.1 | 2.4 | -- | -- |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | -- | -- | 2.7 | -- | -- | 2.5 | -- | 5.8 | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| State | 72.9 | 66.5 | 16.5 | 2.3 | 144.2 | 57.1 | 4.7 | 15.4 | 5.4 | 21.8 | 34.8 | 89.3 |
| County and municipal | 5.0 | 2.5 | -- | -- | -- | -- | -- | 4.2 | 2.7 | 2.5 | 2.7 | -- |
| Forest industry | -- | 1.7 | 9.9 | -- | -- | -- | -- | 4.6 | 13.0 | 2.3 | 2.3 | 4.5 |
| Farmer | 23.2 | 30.1 | 18.7 | 20.4 | 52.3 | 20.6 | 32.5 | 63.1 | 27.9 | 55.2 | 8.9 | 23.2 |
| Misc. private-corp. | 2.5 | 7.7 | 16.5 | 4.3 | 21.3 | 11.9 | 6.9 | 26.4 | 9.7 | 7.4 | 6.2 | 9.7 |
| Misc. private-indiv. | 89.2 | 43.7 | 63.7 | 51.4 | 35.5 | 99.6 | 31.7 | 41.5 | 38.2 | 31.1 | 92.6 | 77.7 |
| All owners | 192.8 | 152.2 | 224.6 | 78.4 | 253.3 | 299.8 | 75.8 | 225.5 | 148.0 | 122.7 | 147.5 | 204.4 |

(Table 3 continued on next page)

(Table 3 continued)

| Ownership class | County |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| National Forest | -- | 101.2 | 45.7 | 19.4 | -- | 136.6 | -- | -- | -- | 89.8 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 4.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| State | 151.0 | 2.7 | -- | 61.3 | 23.6 | 44.0 | 95.6 | 64.9 | 161.0 | 45.0 |
| County and municipal | -- | -- | 2.0 | 2.3 | 2.3 | -- | -- | 2.0 | -- | -- |
| Forest industry | -- | -- | -- | -- | 2.3 | -- | -- | 16.2 | -- | -- |
| Farmer | 127.6 | 38.5 | 39.3 | 8.9 | 32.1 | 4.7 | 29.1 | 90.2 | -- | 55.6 |
| Misc. private-corp. | 7.1 | 20.2 | 11.7 | 9.9 | 9.1 | 30.5 | 20.8 | 15.1 | 27.8 | 22.5 |
| Misc. private-indiv. | 12.2 | 147.4 | 49.6 | 117.7 | 87.4 | 91.4 | 115.3 | 78.5 | 57.9 | 37.4 |
| All owners | 302.0 | 310.0 | 148.3 | 219.5 | 156.8 | 307.2 | 260.8 | 266.9 | 246.7 | 250.3 |

Table 4.--Area of commercial forest land by forest type, physiographic class, and ownership class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and physiographic class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Jack pine | | | | | | | | | | | |
| Hydric | 1.8 | -- | -- | -- | -- | 1.8 | -- | -- | -- | -- | -- |
| Hydromesic | 11.2 | -- | -- | -- | -- | 8.9 | -- | -- | -- | -- | 2.3 |
| Mesic | 53.7 | 9.6 | -- | -- | -- | 24.1 | 2.6 | -- | 7.1 | 5.1 | 5.2 |
| Xeromesic | 404.2 | 114.4 | -- | 1.8 | -- | 183.0 | 2.3 | -- | 15.6 | 11.7 | 75.4 |
| Xeric | 35.8 | 23.7 | -- | -- | -- | 7.5 | -- | -- | -- | -- | 4.6 |
| All classes | 506.7 | 147.7 | -- | 1.8 | -- | 225.3 | 4.9 | -- | 22.7 | 16.8 | 87.5 |
| Red pine | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 2.3 | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- | -- |
| Mesic | 133.8 | 17.4 | -- | -- | -- | 42.5 | 1.7 | 1.7 | 35.6 | 9.6 | 25.3 |
| Xeromesic | 290.9 | 171.1 | -- | -- | -- | 61.7 | -- | -- | 19.4 | 9.6 | 29.1 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 427.0 | 188.5 | -- | -- | -- | 106.5 | 1.7 | 1.7 | 55.0 | 19.2 | 54.4 |
| White pine | | | | | | | | | | | |
| Hydric | 3.9 | -- | -- | -- | -- | 1.7 | -- | -- | -- | 2.2 | -- |
| Hydromesic | 12.9 | -- | -- | -- | -- | 4.3 | -- | -- | 2.5 | -- | 6.1 |
| Mesic | 46.4 | -- | -- | -- | -- | 14.0 | -- | -- | 11.2 | 8.6 | 12.6 |
| Xeromesic | 12.0 | -- | -- | -- | -- | 4.4 | -- | -- | -- | 2.3 | 5.3 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 75.2 | -- | -- | -- | -- | 24.4 | -- | -- | 13.7 | 13.1 | 24.0 |
| Balsam fir | | | | | | | | | | | |
| Hydric | 1.2 | -- | -- | -- | -- | 1.2 | -- | -- | -- | -- | -- |
| Hydromesic | 31.7 | -- | -- | -- | -- | 4.8 | -- | -- | 6.8 | 6.3 | 13.8 |
| Mesic | 18.5 | 2.9 | -- | -- | -- | 2.2 | -- | -- | 2.3 | 6.7 | 4.4 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 51.4 | 2.9 | -- | -- | -- | 8.2 | -- | -- | 9.1 | 13.0 | 18.2 |
| White spruce | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 9.2 | -- | -- | -- | -- | 2.0 | -- | -- | 4.7 | -- | 2.5 |
| Mesic | 10.4 | -- | -- | -- | -- | -- | 2.5 | -- | -- | -- | 7.9 |
| Xeromesic | 2.3 | -- | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 21.9 | -- | -- | -- | -- | 2.0 | 2.5 | -- | 7.0 | -- | 10.4 |

(Table 4 continued on next page)

(Table 4 continued)

| Forest type and physiographic class | All owners | Ownership class | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Black spruce | | | | | | | | | | | |
| Hydric | 8.2 | -- | -- | -- | -- | 5.7 | -- | -- | -- | 2.5 | -- |
| Hydromesic | 18.1 | -- | -- | -- | -- | 8.6 | -- | -- | 5.0 | -- | 4.5 |
| Mesic | 1.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.7 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 28.0 | -- | -- | -- | -- | 14.3 | -- | -- | 5.0 | 2.5 | 6.2 |
| Northern white-cedar | | | | | | | | | | | |
| Hydric | 45.3 | 6.1 | -- | -- | -- | 16.0 | -- | -- | 9.7 | -- | 13.5 |
| Hydromesic | 292.5 | 15.0 | -- | -- | -- | 83.0 | -- | 4.5 | 93.1 | 13.7 | 83.2 |
| Mesic | 17.7 | -- | -- | -- | -- | -- | -- | 2.3 | 5.0 | 2.3 | 8.1 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 355.5 | 21.1 | -- | -- | -- | 99.0 | -- | 6.8 | 107.8 | 16.0 | 104.8 |
| Tamarack | | | | | | | | | | | |
| Hydric | 15.6 | -- | -- | -- | -- | 8.6 | -- | -- | -- | 2.3 | 4.7 |
| Hydromesic | 15.0 | -- | -- | -- | -- | 2.0 | -- | -- | 2.0 | -- | 11.0 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 30.6 | -- | -- | -- | -- | 10.6 | -- | -- | 2.0 | 2.3 | 15.7 |
| Oak-hickory | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 40.3 | 6.9 | -- | -- | -- | 6.8 | -- | -- | 7.4 | -- | 19.2 |
| Mesic | 640.2 | 32.0 | -- | -- | -- | 192.3 | 5.0 | 9.7 | 69.0 | 60.0 | 272.2 |
| Xeromesic | 373.8 | 187.1 | -- | 10.8 | -- | 70.4 | -- | -- | 14.7 | 20.7 | 70.1 |
| Xeric | 13.8 | 11.4 | -- | -- | -- | 2.4 | -- | -- | -- | -- | -- |
| All classes | 1,068.1 | 237.4 | -- | 10.8 | -- | 271.9 | 5.0 | 9.7 | 91.1 | 80.7 | 361.5 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Hydric | 41.9 | 2.0 | -- | -- | -- | 15.4 | -- | 2.3 | 10.9 | 2.5 | 8.8 |
| Hydromesic | 364.7 | 18.5 | -- | -- | -- | 74.3 | 2.7 | 11.7 | 96.9 | 34.9 | 125.7 |
| Mesic | 9.7 | -- | -- | -- | -- | 2.5 | -- | -- | 2.5 | -- | 4.7 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 416.3 | 20.5 | -- | -- | -- | 92.2 | 2.7 | 14.0 | 110.3 | 37.4 | 139.2 |

(Table 4 continued on next page)

(Table 4 continued)

| Forest type and physiographic class | All owners | Ownership class<br>National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maple-birch | | | | | | | | | | | |
| Hydric | 7.6 | -- | -- | -- | -- | -- | -- | -- | 2.4 | 2.5 | 2.7 |
| Hydromesic | 118.3 | 0.6 | -- | -- | -- | 12.5 | 2.0 | -- | 41.9 | 9.4 | 51.9 |
| Mesic | 1,444.7 | 67.2 | -- | -- | -- | 356.9 | 2.5 | 12.6 | 443.3 | 72.8 | 489.4 |
| Xeromesic | 91.8 | 6.7 | -- | -- | -- | 33.6 | -- | -- | 11.7 | 6.9 | 32.9 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 1,662.4 | 74.5 | -- | -- | -- | 403.0 | 4.5 | 12.6 | 499.3 | 91.6 | 576.9 |
| Aspen | | | | | | | | | | | |
| Hydric | 12.6 | -- | -- | -- | -- | 2.5 | -- | -- | 5.9 | -- | 4.2 |
| Hydromesic | 392.2 | 12.0 | -- | 2.5 | -- | 103.7 | 2.3 | 2.3 | 73.3 | 27.9 | 168.2 |
| Mesic | 1,210.2 | 71.5 | -- | -- | -- | 351.6 | 12.0 | 20.6 | 207.7 | 111.7 | 435.1 |
| Xeromesic | 193.8 | 73.7 | -- | -- | -- | 65.8 | -- | -- | 7.1 | 11.5 | 35.7 |
| Xeric | 8.7 | 8.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 1,817.5 | 165.9 | -- | 2.5 | -- | 523.6 | 14.3 | 22.9 | 294.0 | 151.1 | 643.2 |
| Paper birch | | | | | | | | | | | |
| Hydric | 2.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.5 |
| Hydromesic | 59.2 | 0.1 | -- | -- | -- | 10.8 | 2.0 | 2.3 | 16.2 | 9.7 | 18.1 |
| Mesic | 51.1 | 0.9 | -- | -- | -- | 11.8 | -- | 4.9 | 12.2 | 2.5 | 18.8 |
| Xeromesic | 1.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 113.9 | 1.0 | -- | -- | -- | 22.6 | 2.0 | 7.2 | 28.4 | 12.2 | 40.5 |
| Exotic | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 3.9 | -- | -- | -- | -- | -- | -- | -- | -- | 2.2 | 1.7 |
| Mesic | 28.6 | -- | -- | -- | -- | -- | -- | 1.1 | 6.7 | -- | 20.8 |
| Xeromesic | 24.7 | -- | -- | -- | -- | -- | -- | -- | 7.1 | 6.9 | 10.7 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 57.2 | -- | -- | -- | -- | -- | -- | 1.1 | 13.8 | 9.1 | 33.2 |
| Nonstocked | | | | | | | | | | | |
| Hydric | 8.9 | -- | -- | -- | -- | 2.5 | -- | -- | -- | 2.3 | 4.1 |
| Hydromesic | 9.4 | -- | -- | -- | -- | 1.7 | -- | -- | 6.0 | 1.7 | -- |
| Mesic | 17.3 | -- | -- | -- | -- | 4.6 | -- | -- | 7.0 | -- | 5.7 |
| Xeromesic | 25.8 | -- | -- | -- | -- | 10.9 | -- | -- | 2.3 | 5.0 | 7.6 |
| Xeric | 1.8 | -- | -- | -- | -- | 1.8 | -- | -- | -- | -- | -- |
| All classes | 63.2 | -- | -- | -- | -- | 21.5 | -- | -- | 15.3 | 9.0 | 17.4 |
| All types | | | | | | | | | | | |
| Hydric | 149.5 | 8.1 | -- | -- | -- | 55.4 | -- | 2.3 | 28.9 | 14.3 | 40.5 |
| Hydromesic | 1,380.9 | 53.1 | -- | 2.5 | -- | 325.7 | 9.0 | 20.8 | 355.8 | 105.8 | 508.2 |
| Mesic | 3,684.0 | 201.5 | -- | -- | -- | 1,002.5 | 26.3 | 52.9 | 809.6 | 279.3 | 1,311.9 |
| Xeromesic | 1,420.4 | 553.0 | -- | 12.6 | -- | 429.8 | 2.3 | -- | 80.2 | 74.6 | 267.9 |
| Xeric | 60.1 | 43.8 | -- | -- | -- | 11.7 | -- | -- | -- | -- | 4.6 |
| All classes | 6,694.9 | 859.5 | -- | 15.1 | -- | 1,825.1 | 37.6 | 76.0 | 1,274.5 | 474.0 | 2,133.1 |

Table 5.--Area of commercial forest land by ownership class and site class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Site class (cubic feet of growth per acre per year) 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
|---|---|---|---|---|---|---|---|
| National Forest | 859.5 | -- | -- | 3.0 | 92.1 | 346.1 | 418.3 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 15.1 | -- | -- | -- | 2.5 | 3.5 | 9.1 |
| Indian | -- | -- | -- | -- | -- | -- | -- |
| State | 1,825.1 | -- | -- | 33.7 | 369.3 | 685.5 | 736.6 |
| County and municipal | 37.6 | -- | -- | 4.8 | 13.4 | 7.8 | 11.6 |
| Forest industry | 76.0 | -- | -- | -- | 9.4 | 29.0 | 37.6 |
| Farmer | 1,274.5 | -- | -- | 53.8 | 294.0 | 509.6 | 417.1 |
| Misc. private-corp. | 474.0 | -- | -- | 15.1 | 120.6 | 184.4 | 153.9 |
| Misc. private-indiv. | 2,133.1 | -- | -- | 74.6 | 578.5 | 862.8 | 617.2 |
| All owners | 6,694.9 | -- | -- | 185.0 | 1,479.8 | 2,628.7 | 2,401.4 |

Table 6.--Area of commercial forest land by ownership class and stand-volume class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Stand-volume class (board feet[1/]) Less than 1,500 | 1,501 to 5,000 | 5,001+ |
|---|---|---|---|---|
| National Forest | 859.5 | 495.2 | 322.2 | 42.1 |
| Bureau of Land Mgmt. | -- | -- | -- | -- |
| Miscellaneous federal | 15.1 | 15.1 | -- | -- |
| Indian | -- | -- | -- | -- |
| State | 1,825.1 | 1,034.2 | 622.2 | 168.7 |
| County and municipal | 37.6 | 14.2 | 18.6 | 4.8 |
| Forest industry | 76.0 | 28.4 | 37.3 | 10.3 |
| Farmer | 1,274.5 | 541.6 | 552.5 | 180.4 |
| Misc. private-corp. | 474.0 | 226.9 | 149.0 | 98.1 |
| Misc. private-indiv. | 2,133.1 | 972.9 | 854.4 | 305.8 |
| All owners | 6,694.9 | 3,328.5 | 2,556.2 | 810.2 |

[1/] International 1/4-inch rule.

Table 7.--Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class and owner tenure class | Total | Size of owner (acres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-4 | 5-10 | 11-20 | 21-50 | 51-100 | 101-500 | 501-2,500 | 2,501-5,000 | 5001+ |
| Forest Industry | | | | | | | | | | |
| 1-4 years | 15.4 | -- | -- | -- | -- | -- | -- | 1.7 | -- | 13.7 |
| 5-9 years | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 |
| 10-19 years | 37.5 | -- | -- | -- | -- | -- | -- | -- | -- | 37.5 |
| 20+ years | 18.3 | -- | 2.7 | -- | -- | 2.3 | -- | -- | 1.1 | 12.2 |
| All classes | 76.0 | -- | 2.7 | -- | -- | 2.3 | -- | 1.7 | 1.1 | 68.2 |
| Farmer | | | | | | | | | | |
| 1-4 years | 212.4 | 10.3 | 7.3 | 6.2 | 50.3 | 56.9 | 67.1 | 9.6 | 4.7 | -- |
| 5-9 years | 216.3 | 2.3 | 6.5 | 12.1 | 59.7 | 42.9 | 86.0 | 6.8 | -- | -- |
| 10-19 years | 331.9 | 2.2 | 4.5 | 27.1 | 81.6 | 75.1 | 111.3 | 25.3 | 2.3 | 2.5 |
| 20+ years | 513.9 | -- | 5.1 | 14.8 | 89.9 | 136.5 | 210.7 | 30.5 | 2.7 | 23.7 |
| All classes | 1,274.5 | 14.8 | 23.4 | 60.2 | 281.5 | 311.4 | 475.1 | 72.2 | 9.7 | 26.2 |
| Misc. priv.-corporation | | | | | | | | | | |
| 1-4 years | 55.0 | -- | -- | 2.2 | 4.9 | 2.0 | 20.7 | 18.3 | 4.7 | 2.2 |
| 5-9 years | 85.4 | -- | -- | 2.6 | 7.1 | 14.2 | 30.8 | 21.6 | 4.5 | 4.6 |
| 10-19 years | 85.2 | -- | 2.7 | -- | 6.8 | 2.7 | 24.2 | 25.4 | 2.2 | 21.2 |
| 20+ years | 248.4 | -- | -- | -- | 4.9 | 21.2 | 42.5 | 51.4 | 2.3 | 126.1 |
| All classes | 474.0 | -- | 2.7 | 4.8 | 23.7 | 40.1 | 118.2 | 116.7 | 13.7 | 154.1 |
| Misc. priv.-individual | | | | | | | | | | |
| 1-4 years | 545.3 | 23.4 | 31.9 | 53.4 | 130.6 | 109.2 | 142.2 | 54.6 | -- | -- |
| 5-9 years | 425.1 | 7.2 | 32.0 | 44.6 | 127.3 | 94.2 | 94.9 | 24.9 | -- | -- |
| 10-19 years | 511.1 | 2.7 | 11.3 | 33.5 | 123.3 | 132.2 | 164.2 | 43.9 | -- | -- |
| 20+ years | 651.6 | 17.2 | 12.2 | 32.3 | 169.0 | 129.8 | 210.6 | 79.4 | -- | 1.1 |
| All classes | 2,133.1 | 50.5 | 87.4 | 163.8 | 550.2 | 465.4 | 611.9 | 202.8 | -- | 1.1 |
| All private owners | | | | | | | | | | |
| 1-4 years | 828.1 | 33.7 | 39.2 | 61.8 | 185.8 | 168.1 | 230.0 | 84.2 | 9.4 | 15.9 |
| 5-9 years | 731.6 | 9.5 | 38.5 | 59.3 | 194.1 | 151.3 | 211.7 | 53.3 | 4.5 | 9.4 |
| 10-19 years | 965.7 | 4.9 | 18.5 | 60.6 | 211.7 | 210.0 | 299.7 | 94.6 | 4.5 | 61.2 |
| 20+ years | 1,432.2 | 17.2 | 20.0 | 47.1 | 263.8 | 289.8 | 463.8 | 161.3 | 6.1 | 163.1 |
| All classes | 3,957.6 | 65.3 | 116.2 | 228.8 | 855.4 | 819.2 | 1,205.2 | 393.4 | 24.5 | 249.6 |

Table 8.--Area of commercial forest land by forest type, stand-size class, and ownership class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Jack pine | | | | | | | | | | | |
| Sawtimber | 82.1 | 0.7 | -- | -- | -- | 51.2 | -- | -- | 4.1 | 11.9 | 14.2 |
| Poletimber | 247.6 | 85.4 | -- | -- | -- | 98.0 | 2.6 | -- | 8.0 | 4.9 | 48.7 |
| Sapling & seedling | 177.0 | 61.6 | -- | 1.8 | -- | 76.1 | 2.3 | -- | 10.6 | -- | 24.6 |
| All stands | 506.7 | 147.7 | -- | 1.8 | -- | 225.3 | 4.9 | -- | 22.7 | 16.8 | 87.5 |
| Red pine | | | | | | | | | | | |
| Sawtimber | 69.6 | 6.1 | -- | -- | -- | 31.7 | -- | -- | 16.4 | 2.2 | 13.2 |
| Poletimber | 229.8 | 103.1 | -- | -- | -- | 55.2 | -- | 1.7 | 31.1 | 14.6 | 24.1 |
| Sapling & seedling | 127.6 | 79.3 | -- | -- | -- | 19.6 | 1.7 | -- | 7.5 | 2.4 | 17.1 |
| All stands | 427.0 | 188.5 | -- | -- | -- | 106.5 | 1.7 | 1.7 | 55.0 | 19.2 | 54.4 |
| White pine | | | | | | | | | | | |
| Sawtimber | 51.8 | -- | -- | -- | -- | 13.0 | -- | -- | 8.9 | 8.6 | 21.3 |
| Poletimber | 12.3 | -- | -- | -- | -- | 2.5 | -- | -- | 2.6 | 4.5 | 2.7 |
| Sapling & seedling | 11.1 | -- | -- | -- | -- | 8.9 | -- | -- | 2.2 | -- | -- |
| All stands | 75.2 | -- | -- | -- | -- | 24.4 | -- | -- | 13.7 | 13.1 | 24.0 |
| Balsam fir | | | | | | | | | | | |
| Sawtimber | 16.7 | -- | -- | -- | -- | -- | -- | -- | 2.3 | 4.3 | 10.1 |
| Poletimber | 20.0 | -- | -- | -- | -- | 3.0 | -- | -- | 4.5 | 6.4 | 6.1 |
| Sapling & seedling | 14.7 | 2.9 | -- | -- | -- | 5.2 | -- | -- | 2.3 | 2.3 | 2.0 |
| All stands | 51.4 | 2.9 | -- | -- | -- | 8.2 | -- | -- | 9.1 | 13.0 | 18.2 |
| White spruce | | | | | | | | | | | |
| Sawtimber | 4.7 | -- | -- | -- | -- | -- | -- | -- | 4.7 | -- | -- |
| Poletimber | 4.5 | -- | -- | -- | -- | 2.0 | -- | -- | -- | -- | 2.5 |
| Sapling & seedling | 12.7 | -- | -- | -- | -- | -- | 2.5 | -- | 2.3 | -- | 7.9 |
| All stands | 21.9 | -- | -- | -- | -- | 2.0 | 2.5 | -- | 7.0 | -- | 10.4 |
| Black spruce | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 13.4 | -- | -- | -- | -- | 8.4 | -- | -- | 3.0 | -- | 2.0 |
| Sapling & seedling | 14.6 | -- | -- | -- | -- | 6.0 | -- | -- | 1.9 | 2.5 | 4.2 |
| All stands | 28.0 | -- | -- | -- | -- | 14.3 | -- | -- | 5.0 | 2.5 | 6.2 |
| Northern white-cedar | | | | | | | | | | | |
| Sawtimber | 85.6 | -- | -- | -- | -- | 18.0 | -- | -- | 21.9 | 11.5 | 34.2 |
| Poletimber | 234.1 | 21.1 | -- | -- | -- | 69.8 | -- | 6.8 | 70.4 | 4.6 | 61.4 |
| Sapling & seedling | 35.8 | -- | -- | -- | -- | 11.1 | -- | -- | 15.5 | -- | 9.2 |
| All stands | 355.5 | 21.1 | -- | -- | -- | 99.0 | -- | 6.8 | 107.8 | 16.0 | 104.8 |

(Table 8 continued on next page)

(Table 8 continued)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Tamarack | | | | | | | | | | | |
| Sawtimber | 6.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.6 |
| Poletimber | 6.3 | -- | -- | -- | -- | 2.0 | -- | -- | 2.0 | -- | 2.3 |
| Sapling & seedling | 17.7 | -- | -- | -- | -- | 8.6 | -- | -- | -- | 2.3 | 6.8 |
| All stands | 30.6 | -- | -- | -- | -- | 10.6 | -- | -- | 2.0 | 2.3 | 15.7 |
| Oak-hickory | | | | | | | | | | | |
| Sawtimber | 280.3 | 41.6 | -- | -- | -- | 44.6 | 2.3 | 4.8 | 29.7 | 28.0 | 129.3 |
| Poletimber | 577.9 | 159.6 | -- | -- | -- | 172.4 | 2.7 | 4.9 | 46.0 | 40.1 | 152.2 |
| Sapling & seedling | 209.9 | 36.2 | -- | 10.8 | -- | 54.9 | -- | -- | 15.4 | 12.6 | 80.0 |
| All stands | 1,068.1 | 237.4 | -- | 10.8 | -- | 271.9 | 5.0 | 9.7 | 91.1 | 80.7 | 361.5 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Sawtimber | 125.2 | 7.5 | -- | -- | -- | 25.9 | -- | 4.7 | 30.4 | 13.8 | 42.9 |
| Poletimber | 153.6 | 13.0 | -- | -- | -- | 31.4 | -- | 7.0 | 37.8 | 11.0 | 53.4 |
| Sapling & seedling | 137.5 | -- | -- | -- | -- | 34.9 | 2.7 | 2.3 | 42.1 | 12.6 | 42.9 |
| All stands | 416.3 | 20.5 | -- | -- | -- | 92.2 | 2.7 | 14.0 | 110.3 | 37.4 | 139.2 |
| Maple-birch | | | | | | | | | | | |
| Sawtimber | 470.9 | 5.9 | -- | -- | -- | 77.0 | 2.0 | 10.1 | 160.9 | 31.3 | 183.7 |
| Poletimber | 864.7 | 66.5 | -- | -- | -- | 219.4 | 2.5 | 2.5 | 247.6 | 47.0 | 279.2 |
| Sapling & seedling | 326.8 | 2.1 | -- | -- | -- | 106.6 | -- | -- | 90.9 | 13.3 | 113.9 |
| All stands | 1,662.4 | 74.5 | -- | -- | -- | 403.0 | 4.5 | 12.6 | 499.4 | 91.6 | 576.8 |
| Aspen | | | | | | | | | | | |
| Sawtimber | 310.7 | 4.9 | -- | -- | -- | 78.9 | 2.2 | 2.3 | 74.1 | 34.3 | 114.0 |
| Poletimber | 661.5 | 67.4 | -- | 2.5 | -- | 143.9 | 9.6 | 4.8 | 130.3 | 41.1 | 261.9 |
| Sapling & seedling | 845.3 | 93.6 | -- | -- | -- | 300.8 | 2.5 | 15.8 | 89.6 | 75.7 | 267.3 |
| All stands | 1,817.5 | 165.9 | -- | 2.5 | -- | 523.6 | 14.3 | 22.9 | 294.0 | 151.1 | 643.2 |
| Paper birch | | | | | | | | | | | |
| Sawtimber | 4.5 | -- | -- | -- | -- | -- | -- | 4.5 | -- | -- | -- |
| Poletimber | 85.9 | 1.0 | -- | -- | -- | 22.6 | -- | 2.7 | 21.6 | 12.2 | 25.8 |
| Sapling & seedling | 23.5 | -- | -- | -- | -- | -- | 2.0 | -- | 6.8 | -- | 14.7 |
| All stands | 113.9 | 1.0 | -- | -- | -- | 22.6 | 2.0 | 7.2 | 28.4 | 12.2 | 40.5 |
| Exotic | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 25.5 | -- | -- | -- | -- | -- | -- | -- | 12.0 | 2.2 | 11.3 |
| Sapling & seedling | 31.7 | -- | -- | -- | -- | -- | -- | 1.1 | 1.8 | 6.9 | 21.9 |
| All stands | 57.2 | -- | -- | -- | -- | -- | -- | 1.1 | 13.8 | 9.1 | 33.2 |
| Nonstocked | 63.2 | -- | -- | -- | -- | 21.5 | -- | -- | 15.3 | 9.0 | 17.4 |
| All types | | | | | | | | | | | |
| Sawtimber | 1,508.7 | 66.7 | -- | -- | -- | 340.3 | 6.5 | 26.4 | 353.4 | 145.9 | 569.5 |
| Poletimber | 3,137.1 | 517.1 | -- | 2.5 | -- | 830.6 | 17.4 | 30.4 | 616.9 | 188.6 | 933.6 |
| Sapling & seedling | 1,985.9 | 275.7 | -- | 12.6 | -- | 632.7 | 13.7 | 19.2 | 288.9 | 130.6 | 612.5 |
| Nonstocked | 63.2 | -- | -- | -- | -- | 21.5 | -- | -- | 15.3 | 8.9 | 17.5 |
| All stands | 6,694.9 | 859.5 | -- | 15.1 | -- | 1,825.1 | 37.6 | 76.0 | 1,274.5 | 474.0 | 2,133.1 |

Table 9.--Area of commercial forest land by forest type and county, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alcona | Alpena | Antrim | Arena | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| Jack pine | 506.7 | 18.5 | 1.8 | -- | 2.6 | -- | -- | -- | 20.8 | 28.8 | 85.2 | -- |
| Red pine | 427.0 | 15.6 | 2.2 | -- | -- | -- | 9.1 | 2.2 | 13.1 | 11.4 | 19.1 | 4.0 |
| White pine | 75.2 | 5.9 | 2.3 | -- | -- | -- | -- | 4.7 | 4.7 | -- | 4.3 | -- |
| Balsam fir | 51.4 | 3.2 | 8.5 | -- | -- | -- | -- | 2.2 | 6.8 | -- | 2.4 | -- |
| White spruce | 21.9 | -- | 7.2 | -- | -- | -- | -- | -- | 2.2 | -- | .0 | 3.0 |
| Black spruce | 28.0 | 3.7 | -- | -- | -- | -- | -- | 2.8 | 5.2 | -- | 6.5 | -- |
| Northern white-cedar | 355.5 | 14.8 | 19.9 | 12.9 | -- | -- | 4.3 | 9.0 | 45.1 | 3.4 | 6.9 | 17.5 |
| Tamarack | 30.6 | 2.4 | -- | -- | -- | -- | -- | 2.0 | 3.1 | 2.3 | -- | -- |
| Oak-hickory | 1,068.1 | 87.3 | 6.7 | -- | 15.7 | -- | 2.2 | -- | 8.9 | 29.3 | 76.5 | 2.5 |
| Elm-ash-soft maple | 416.3 | 8.8 | 23.4 | 4.7 | 13.5 | 4.8 | 12.0 | 4.2 | 15.8 | 26.3 | -- | 10.4 |
| Maple-birch | 1,662.4 | 34.9 | 21.9 | 111.8 | 15.8 | 6.2 | 75.1 | 86.2 | 112.0 | 38.3 | 35.6 | 109.8 |
| Aspen | 1,817.5 | 103.8 | 106.3 | 22.8 | 38.4 | 6.8 | 16.2 | 13.7 | 109.9 | 73.4 | 36.4 | 48.0 |
| Paper birch | 113.9 | 5.3 | 9.2 | -- | 4.3 | -- | -- | 9.1 | 16.8 | 2.5 | -- | -- |
| Exotic | 57.2 | -- | -- | 2.2 | 2.4 | -- | 2.2 | -- | -- | -- | -- | -- |
| Nonstocked | 63.2 | 2.3 | 8.3 | 2.2 | -- | -- | -- | 2.5 | 2.2 | -- | -- | -- |
| All types | 6,694.9 | 306.5 | 217.7 | 156.6 | 92.7 | 17.8 | 121.1 | 138.6 | 366.6 | 215.7 | 272.9 | 195.2 |

(Table 9 continued)

(Table 9 continued)

| Forest type | County | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
| Jack pine | 1.8 | 14.1 | 40.9 | -- | 30.8 | 27.7 | -- | 12.5 | 6.7 | 0.1 | -- | 6.5 |
| Red pine | -- | 19.3 | 40.2 | 4.0 | 31.9 | 33.2 | 2.6 | 20.5 | 9.7 | 4.4 | -- | 4.0 |
| White pine | -- | 2.3 | 2.2 | -- | 3.9 | 7.3 | 2.5 | 1.8 | -- | 2.5 | 2.7 | 2.3 |
| Balsam fir | -- | -- | 2.6 | -- | -- | -- | -- | -- | -- | -- | -- | 2.3 |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.7 | -- | -- |
| Black spruce | -- | -- | 1.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | 7.1 | 19.0 | 4.0 | 11.6 | 11.3 | 6.9 | 2.8 | 3.0 | 3.3 | -- | 10.6 |
| Tamarack | -- | 1.8 | 4.1 | -- | -- | -- | -- | -- | -- | -- | -- | 4.7 |
| Oak-hickory | 18.4 | 23.5 | 26.9 | 8.4 | 17.0 | 134.3 | -- | 54.0 | 51.0 | 14.4 | 18.8 | 24.3 |
| Elm-ash-soft maple | 22.9 | 4.8 | 9.2 | 8.8 | 1.7 | 16.4 | 2.3 | 17.1 | 19.2 | 18.7 | 25.8 | 17.9 |
| Maple-birch | 11.7 | 38.8 | 33.9 | 14.2 | 90.5 | 27.5 | 59.2 | 68.8 | 18.4 | 26.1 | 32.1 | 50.6 |
| Aspen | 129.1 | 37.9 | 39.5 | 30.8 | 54.4 | 38.6 | 2.3 | 32.1 | 32.3 | 40.6 | 65.8 | 71.7 |
| Paper birch | 6.8 | -- | 4.5 | 2.3 | 2.0 | 1.1 | -- | 2.7 | -- | 2.5 | 2.3 | 4.8 |
| Exotic | -- | 2.6 | -- | 2.4 | 1.8 | 2.4 | -- | 4.4 | 6.1 | 5.1 | -- | 4.7 |
| Nonstocked | 2.1 | -- | -- | 3.5 | 7.7 | -- | -- | 8.8 | 1.6 | 2.3 | -- | -- |
| All types | 192.8 | 152.2 | 224.6 | 78.4 | 253.3 | 299.8 | 75.8 | 225.5 | 148.0 | 122.7 | 147.5 | 204.4 |

(Table 9 continued on next page)

(Table 9 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| Jack pine | 26.6 | 9.8 | 0.9 | 32.9 | -- | 68.2 | 21.8 | 18.3 | 19.3 | 10.1 |
| Red pine | 12.2 | 26.4 | 15.4 | 4.1 | -- | 32.8 | 21.8 | 7.7 | 7.4 | 52.7 |
| White pine | 4.5 | 2.7 | -- | -- | -- | 5.4 | 8.3 | -- | 2.3 | 2.6 |
| Balsam fir | 4.0 | -- | -- | -- | -- | 5.7 | 6.0 | 6.5 | 1.2 | -- |
| White spruce | -- | -- | -- | -- | -- | -- | 2.5 | -- | 2.0 | 2.3 |
| Black spruce | -- | -- | -- | -- | -- | 2.1 | 1.9 | 4.2 | -- | -- |
| Northern white-cedar | 13.1 | 1.3 | 2.7 | 11.1 | 8.8 | 7.7 | 7.8 | 56.4 | 24.9 | 8.3 |
| Tamarack | 5.1 | 2.6 | -- | -- | -- | -- | -- | 2.5 | -- | -- |
| Oak-hickory | 37.2 | 124.3 | 35.0 | 40.4 | 13.8 | 67.1 | 7.0 | 22.2 | 85.0 | 16.0 |
| Elm-ash-soft maple | 6.0 | 39.8 | 23.2 | 4.1 | 13.8 | 2.3 | -- | 14.7 | 10.6 | 13.1 |
| Maple-birch | 85.6 | 43.9 | 35.7 | 30.1 | 69.4 | 27.1 | 120.4 | 26.0 | 24.2 | 80.6 |
| Aspen | 89.1 | 52.6 | 29.0 | 83.6 | 45.3 | 88.7 | 63.3 | 94.0 | 67.5 | 53.6 |
| Paper birch | 2.5 | -- | -- | 11.4 | 2.3 | 0.1 | -- | 14.4 | 2.3 | 4.7 |
| Exotic | 4.1 | 6.6 | 2.5 | -- | 3.4 | -- | -- | -- | -- | 4.3 |
| Nonstocked | 12.0 | -- | 3.9 | 1.8 | -- | -- | -- | -- | -- | 2.0 |
| All types | 302.0 | 310.0 | 148.3 | 219.5 | 156.8 | 307.2 | 260.8 | 266.9 | 246.7 | 250.3 |

Table 10.--Area of commercial forest land by county and stand-size class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| County | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Alcona | 306.5 | 74.8 | 152.0 | 77.4 | 2.3 |
| Alpena | 217.7 | 55.7 | 85.3 | 68.4 | 8.3 |
| Antrim | 156.6 | 25.1 | 107.1 | 22.2 | 2.2 |
| Arenac | 92.7 | 16.2 | 46.5 | 30.0 | -- |
| Bay | 17.8 | 2.0 | 8.8 | 7.0 | -- |
| Benzie | 121.1 | 29.2 | 56.0 | 35.9 | -- |
| Charlevoix | 138.6 | 46.5 | 80.9 | 8.8 | 2.4 |
| Cheboygan | 366.6 | 74.7 | 207.2 | 82.5 | 2.2 |
| Clare | 215.7 | 50.0 | 77.5 | 88.2 | -- |
| Crawford | 272.9 | 35.8 | 136.5 | 100.6 | -- |
| Emmet | 195.2 | 54.1 | 114.2 | 26.9 | -- |
| Gladwin | 192.8 | 36.3 | 89.9 | 64.5 | 2.1 |
| Grand Traverse | 152.2 | 43.6 | 70.8 | 37.8 | -- |
| Iosco | 224.6 | 49.7 | 115.7 | 59.2 | -- |
| Isabella | 78.4 | 24.3 | 20.4 | 30.2 | 3.5 |
| Kalkaska | 253.3 | 39.6 | 129.8 | 76.2 | 7.7 |
| Lake | 299.8 | 67.4 | 162.8 | 69.6 | -- |
| Leelanau | 75.8 | 42.1 | 24.4 | 9.3 | -- |
| Manistee | 225.5 | 57.9 | 83.2 | 75.6 | 8.8 |
| Mason | 148.0 | 40.5 | 70.0 | 35.9 | 1.6 |
| Mecosta | 122.7 | 32.4 | 34.6 | 53.4 | 2.3 |
| Midland | 147.5 | 41.3 | 60.3 | 45.9 | -- |
| Missaukee | 204.4 | 39.7 | 79.2 | 85.5 | -- |
| Montmorency | 302.0 | 40.6 | 107.9 | 141.5 | 12.0 |
| Newaygo | 310.0 | 86.6 | 126.1 | 97.3 | -- |
| Oceana | 148.3 | 44.3 | 64.7 | 35.4 | 3.9 |
| Ogemaw | 219.5 | 35.3 | 117.8 | 64.6 | 1.8 |
| Osceola | 156.8 | 66.6 | 39.6 | 50.6 | -- |
| Oscoda | 307.2 | 52.0 | 125.9 | 129.3 | -- |
| Otsego | 260.8 | 43.2 | 137.0 | 80.6 | -- |
| Presque Isle | 266.9 | 54.4 | 125.4 | 87.1 | -- |
| Roscommon | 246.7 | 58.3 | 137.6 | 50.8 | -- |
| Wexford | 250.3 | 48.5 | 142.0 | 57.7 | 2.1 |
| All counties | 6,694.9 | 1,508.7 | 3,137.1 | 1,985.9 | 63.2 |

Table 11.--Area of commercial forest land by forest type, stand-size class, and site class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Jack pine | | | | | | | |
| Sawtimber | 82.1 | -- | -- | -- | 2.3 | 19.7 | 60.1 |
| Poletimber | 247.6 | -- | -- | -- | 7.1 | 36.9 | 203.6 |
| Sapling & seedling | 177.0 | -- | -- | -- | -- | 12.0 | 165.0 |
| All stands | 506.7 | -- | -- | -- | 9.4 | 68.6 | 428.7 |
| Red pine | | | | | | | |
| Sawtimber | 69.6 | -- | -- | -- | 35.2 | 30.0 | 4.4 |
| Poletimber | 229.8 | -- | -- | 28.7 | 103.8 | 77.3 | 20.0 |
| Sapling & seedling | 127.6 | -- | -- | 6.9 | 19.7 | 89.0 | 12.0 |
| All stands | 427.0 | -- | -- | 35.6 | 158.7 | 196.3 | 36.4 |
| White pine | | | | | | | |
| Sawtimber | 51.8 | -- | -- | 4.7 | 20.2 | 18.2 | 8.7 |
| Poletimber | 12.3 | -- | -- | -- | 5.0 | 7.3 | -- |
| Sapling & seedling | 11.1 | -- | -- | 2.2 | 2.2 | 2.2 | 4.5 |
| All stands | 75.2 | -- | -- | 6.9 | 27.4 | 27.7 | 13.2 |
| Balsam fir | | | | | | | |
| Sawtimber | 16.7 | -- | -- | 2.2 | 9.4 | 2.3 | 2.8 |
| Poletimber | 20.0 | -- | -- | -- | 10.6 | 9.4 | -- |
| Sapling & seedling | 14.7 | -- | -- | 4.3 | 9.2 | 1.2 | -- |
| All stands | 51.4 | -- | -- | 6.5 | 29.2 | 12.9 | 2.8 |
| White spruce | | | | | | | |
| Sawtimber | 4.7 | -- | -- | -- | -- | 2.5 | 2.2 |
| Poletimber | 4.5 | -- | -- | -- | -- | -- | 4.5 |
| Sapling & seedling | 12.7 | -- | -- | -- | 8.2 | 2.2 | 2.3 |
| All stands | 21.9 | -- | -- | -- | 8.2 | 4.7 | 9.0 |
| Black spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 13.4 | -- | -- | -- | 4.8 | 2.0 | 6.6 |
| Sapling & seedling | 14.6 | -- | -- | -- | -- | 1.7 | 12.9 |
| All stands | 28.0 | -- | -- | -- | 4.8 | 3.7 | 19.5 |
| Northern white-cedar | | | | | | | |
| Sawtimber | 85.6 | -- | -- | -- | -- | 13.8 | 71.8 |
| Poletimber | 234.1 | -- | -- | -- | 2.3 | 31.4 | 200.4 |
| Sapling & seedling | 35.8 | -- | -- | -- | -- | 2.2 | 33.6 |
| All stands | 355.5 | -- | -- | -- | 2.3 | 47.4 | 305.8 |

(Table 11 continued on next page)

(Table 11 continued)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Tamarack | | | | | | | |
| Sawtimber | 6.6 | -- | -- | -- | -- | 4.3 | 2.3 |
| Poletimber | 6.3 | -- | -- | -- | 2.3 | 4.0 | -- |
| Sapling & seedling | 17.7 | -- | -- | -- | -- | 3.1 | 14.6 |
| All stands | 30.6 | -- | -- | -- | 2.3 | 11.4 | 16.9 |
| Oak-hickory | | | | | | | |
| Sawtimber | 280.3 | -- | -- | 2.2 | 37.8 | 116.3 | 124.0 |
| Poletimber | 577.9 | -- | -- | -- | 53.8 | 275.6 | 248.5 |
| Sapling & seedling | 209.9 | -- | -- | -- | 7.2 | 74.4 | 128.3 |
| All stands | 1,068.1 | -- | -- | 2.2 | 98.8 | 466.3 | 500.8 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 125.2 | -- | -- | -- | 23.6 | 38.4 | 63.2 |
| Poletimber | 153.6 | -- | -- | -- | 8.8 | 42.2 | 102.6 |
| Sapling & seedling | 137.5 | -- | -- | -- | 4.2 | 42.1 | 91.2 |
| All stands | 416.3 | -- | -- | -- | 36.6 | 122.7 | 257.0 |
| Maple-birch | | | | | | | |
| Sawtimber | 470.9 | -- | -- | 19.4 | 139.6 | 237.6 | 74.3 |
| Poletimber | 864.7 | -- | -- | 28.3 | 177.6 | 448.2 | 210.6 |
| Sapling & seedling | 326.8 | -- | -- | 2.7 | 32.9 | 134.4 | 156.8 |
| All stands | 1,662.4 | -- | -- | 50.4 | 350.1 | 820.2 | 441.7 |
| Aspen | | | | | | | |
| Sawtimber | 310.7 | -- | -- | 27.9 | 142.9 | 102.4 | 37.5 |
| Poletimber | 661.5 | -- | -- | 18.3 | 260.8 | 313.3 | 69.1 |
| Sapling & seedling | 845.3 | -- | -- | 31.4 | 312.6 | 356.4 | 144.9 |
| All stands | 1,817.5 | -- | -- | 77.6 | 716.3 | 772.1 | 251.5 |
| Paper birch | | | | | | | |
| Sawtimber | 4.5 | -- | -- | -- | -- | 2.2 | 2.3 |
| Poletimber | 85.9 | -- | -- | -- | 4.9 | 31.7 | 49.3 |
| Sapling & seedling | 23.5 | -- | -- | -- | -- | 8.4 | 15.1 |
| All stands | 113.9 | -- | -- | -- | 4.9 | 42.3 | 66.7 |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 25.5 | -- | -- | 3.5 | 17.3 | 4.7 | -- |
| Sapling & seedling | 31.7 | -- | -- | 2.3 | 8.5 | 13.6 | 7.3 |
| All stands | 57.2 | -- | -- | 5.8 | 25.8 | 18.3 | 7.3 |
| Nonstocked | 63.2 | -- | -- | -- | 5.0 | 14.1 | 44.1 |
| All types | | | | | | | |
| Sawtimber | 1,508.7 | -- | -- | 56.4 | 411.0 | 587.7 | 453.6 |
| Poletimber | 3,137.1 | -- | -- | 78.8 | 659.1 | 1,284.0 | 1,115.2 |
| Sapling & seedling | 1,985.9 | -- | -- | 49.8 | 404.7 | 742.9 | 788.5 |
| Nonstocked | 63.2 | -- | -- | -- | 5.0 | 14.1 | 44.1 |
| All stands | 6,694.9 | -- | -- | 185.0 | 1,479.8 | 2,628.7 | 2,401.4 |

Table 12.--Area of commercial forest land by forest type and stand-age class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All ages | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 506.7 | 46.5 | 85.5 | 52.2 | 94.6 | 95.0 | 57.5 | 23.1 | 34.9 | 9.9 | 2.7 | 2.3 | 2.5 | -- |
| Red pine | 427.0 | 39.0 | 82.5 | 144.3 | 66.1 | 46.6 | 6.2 | 11.8 | 8.5 | 9.4 | 4.4 | 8.2 | -- | -- |
| White pine | 75.2 | 2.2 | 8.9 | 5.2 | -- | 7.1 | 6.9 | 4.0 | 10.3 | 9.6 | 13.6 | 2.5 | 4.9 | -- |
| Balsam fir | 51.4 | -- | 12.5 | 2.2 | -- | 4.5 | 8.1 | 9.4 | 2.3 | 5.0 | -- | 2.3 | 5.1 | -- |
| White spruce | 21.9 | 2.2 | 10.5 | -- | -- | -- | 2.0 | -- | -- | 5.0 | -- | -- | -- | 2.2 |
| Black spruce | 28.0 | 7.0 | 5.8 | -- | -- | 6.8 | 3.5 | 1.9 | 3.0 | -- | -- | -- | -- | -- |
| Northern white-cedar | 355.5 | 5.7 | 9.8 | 13.0 | 15.0 | 13.4 | 45.0 | 51.6 | 48.1 | 50.2 | 32.5 | 36.7 | 16.9 | 17.6 |
| Tamarack | 30.6 | 7.8 | 2.3 | 4.4 | 5.5 | -- | 4.0 | 2.5 | 1.8 | -- | -- | 2.3 | -- | -- |
| Oak-hickory | 1,068.1 | 124.8 | 76.7 | 14.0 | 49.3 | 111.7 | 233.7 | 164.6 | 74.1 | 68.5 | 58.6 | 72.1 | 17.6 | 2.4 |
| Elm-ash-soft maple | 416.3 | 62.1 | 50.7 | 20.3 | 31.5 | 52.8 | 37.8 | 46.9 | 37.3 | 22.3 | 15.5 | 23.0 | 16.1 | -- |
| Maple-birch | 1,662.4 | 167.7 | 125.2 | 47.5 | 104.1 | 289.0 | 330.3 | 167.0 | 115.2 | 132.3 | 77.7 | 86.5 | 19.9 | -- |
| Aspen | 1,817.5 | 410.7 | 378.3 | 80.2 | 132.0 | 225.1 | 240.1 | 119.3 | 88.9 | 58.5 | 41.7 | 34.0 | 8.7 | -- |
| Paper birch | 113.9 | 10.1 | 10.7 | 2.7 | 10.2 | 10.2 | 30.5 | 28.4 | 8.7 | 0.1 | 2.3 | -- | -- | -- |
| Exotic | 57.2 | 6.0 | 20.7 | 20.1 | 6.0 | 2.2 | 2.2 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 63.2 | 32.1 | 14.8 | 6.5 | 1.6 | 4.2 | 1.8 | -- | -- | 2.2 | -- | -- | -- | -- |
| All types | 6,694.9 | 923.9 | 894.9 | 412.6 | 515.9 | 868.6 | 1,009.6 | 630.5 | 433.1 | 373.0 | 249.0 | 269.9 | 91.7 | 22.2 |

Table 13.--Area of commercial forest land by forest type and site-index class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| Jack pine | 506.7 | -- | -- | 60.8 | 200.7 | 183.5 | 46.4 | 7.8 | 7.5 | -- |
| Red pine | 427.0 | -- | -- | 2.6 | 90.9 | 139.2 | 108.3 | 66.3 | 19.7 | -- |
| White pine | 75.2 | -- | -- | 6.4 | 12.1 | 22.5 | 22.4 | 7.1 | 4.7 | -- |
| Balsam fir | 51.4 | -- | -- | 2.8 | 17.2 | 24.9 | 4.2 | 2.3 | -- | -- |
| White spruce | 21.9 | -- | 4.7 | 4.3 | 2.2 | 2.5 | -- | 5.5 | 2.7 | -- |
| Black spruce | 28.0 | -- | 1.9 | 9.9 | 7.6 | 3.7 | 4.9 | -- | -- | -- |
| Northern white-cedar | 355.5 | 15.4 | 120.4 | 142.6 | 51.1 | 12.3 | 11.4 | 2.3 | -- | -- |
| Tamarack | 30.6 | -- | 8.2 | 8.7 | -- | 8.3 | 3.1 | -- | 2.3 | -- |
| Oak-hickory | 1,068.1 | -- | 2.3 | 49.4 | 271.5 | 339.9 | 244.2 | 119.1 | 29.6 | 12.1 |
| Elm-ash-soft maple | 416.3 | -- | 5.5 | 39.6 | 48.5 | 97.1 | 120.2 | 68.8 | 13.8 | 22.8 |
| Maple-birch | 1,662.4 | -- | -- | 27.5 | 116.6 | 297.5 | 465.8 | 477.0 | 210.7 | 67.3 |
| Aspen | 1,817.5 | -- | 2.7 | 24.6 | 104.9 | 273.0 | 507.8 | 532.9 | 293.9 | 77.7 |
| Paper birch | 113.9 | -- | 0.1 | 9.8 | 18.0 | 34.1 | 33.7 | 13.3 | 4.9 | -- |
| Exotic | 57.2 | -- | -- | -- | 12.5 | 13.0 | 21.0 | 9.6 | -- | 1.1 |
| Nonstocked | 63.2 | -- | 1.6 | 11.3 | 23.4 | 12.7 | 6.6 | 7.6 | -- | -- |
| All types | 6,694.9 | 15.4 | 147.4 | 400.3 | 977.2 | 1,464.2 | 1,600.0 | 1,319.6 | 589.8 | 181.0 |

Table 14.--Area of commercial forest land by forest type, stand-size class, and basal-area class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 82.1 | -- | -- | 4.2 | 9.4 | 9.9 | 7.2 | 20.6 | 12.3 | 6.5 | 7.4 | 4.6 | -- | -- | -- |
| Poletimber | 247.6 | -- | -- | 7.0 | 5.1 | 51.1 | 13.5 | 32.5 | 40.9 | 24.0 | 35.8 | 22.0 | 15.7 | -- | -- |
| Sapling & seedling | 177.0 | 14.0 | 9.7 | 16.0 | 29.5 | 33.5 | 23.6 | 21.5 | 12.0 | 4.9 | 4.1 | .00 | 8.2 | -- | -- |
| All stands | 506.7 | 14.0 | 9.7 | 27.2 | 44.0 | 94.5 | 44.3 | 74.6 | 65.2 | 35.4 | 47.3 | 26.6 | 23.9 | -- | -- |
| Red pine | | | | | | | | | | | | | | |
| Sawtimber | 69.6 | -- | -- | -- | 6.3 | 6.5 | -- | 8.8 | 8.5 | 4.3 | 2.0 | 12.6 | 9.2 | 7.9 | 3.5 |
| Poletimber | 229.8 | -- | -- | -- | 2.2 | 2.2 | 8.9 | 9.3 | 29.2 | 18.2 | 16.1 | 28.7 | 44.1 | 46.0 | 24.9 |
| Sapling & seedling | 127.6 | 34.9 | 3.9 | 6.5 | 2.2 | 6.2 | 28.9 | 17.8 | 14.0 | 7.3 | -- | 3.5 | 2.4 | -- | -- |
| All stands | 427.0 | 34.9 | 3.9 | 6.5 | 10.7 | 14.9 | 37.8 | 35.9 | 51.7 | 29.8 | 18.1 | 44.8 | 55.7 | 53.9 | 28.4 |
| White pine | | | | | | | | | | | | | | |
| Sawtimber | 51.8 | -- | -- | -- | 4.0 | 3.8 | -- | 6.1 | 5.0 | 10.8 | 5.4 | 11.9 | -- | 4.8 | -- |
| Poletimber | 12.3 | -- | -- | -- | -- | -- | 2.2 | 2.6 | 2.5 | 2.4 | -- | 2.6 | -- | -- | -- |
| Sapling & seedling | 11.1 | -- | -- | 2.2 | -- | 4.4 | 2.3 | 2.2 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 75.2 | -- | -- | 2.2 | 4.0 | 8.2 | 4.5 | 10.9 | 7.5 | 13.2 | 5.4 | 14.5 | -- | 4.8 | -- |
| Balsam fir | | | | | | | | | | | | | | |
| Sawtimber | 16.7 | -- | -- | -- | -- | -- | 4.5 | -- | -- | -- | 6.7 | 2.7 | -- | 2.8 | -- |
| Poletimber | 20.0 | -- | -- | -- | -- | 4.1 | 2.2 | 1.8 | 2.3 | -- | -- | 4.3 | 5.3 | -- | -- |
| Sapling & seedling | 14.7 | -- | 3.0 | -- | -- | 4.3 | -- | -- | 4.5 | 2.9 | -- | -- | -- | -- | -- |
| All stands | 51.4 | -- | 3.0 | -- | -- | 8.4 | 6.7 | 1.8 | 6.8 | 2.9 | 6.7 | 7.0 | 5.3 | 2.8 | -- |
| White spruce | | | | | | | | | | | | | | |
| Sawtimber | 4.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.5 | 2.2 | -- | -- | -- |
| Poletimber | 4.5 | -- | -- | -- | -- | -- | -- | -- | -- | 2.0 | -- | 2.5 | -- | -- | -- |
| Sapling & seedling | 12.7 | 2.3 | 3.0 | -- | 2.2 | -- | -- | -- | 2.5 | -- | -- | 2.7 | -- | -- | -- |
| All stands | 21.9 | 2.3 | 3.0 | -- | 2.2 | -- | -- | -- | 2.5 | 2.0 | 2.5 | 7.4 | -- | -- | -- |
| Black spruce | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 13.4 | -- | -- | 1.6 | -- | -- | -- | 2.0 | -- | 2.0 | 2.0 | 2.8 | -- | 3.0 | -- |
| Sapling & seedling | 14.6 | 2.2 | 7.1 | -- | 1.7 | -- | -- | 1.6 | -- | -- | -- | -- | 2.0 | -- | -- |
| All stands | 28.0 | 2.2 | 7.1 | 1.6 | 1.7 | -- | -- | 3.6 | -- | 2.0 | 2.0 | 2.8 | 2.0 | 3.0 | -- |
| Northern white-cedar | | | | | | | | | | | | | | |
| Sawtimber | 85.6 | -- | -- | -- | -- | -- | -- | 2.6 | -- | -- | 8.8 | 14.1 | 18.4 | 19.6 | 22.1 |
| Poletimber | 234.1 | -- | -- | -- | 2.3 | -- | 4.1 | 4.0 | 9.6 | 6.4 | 3.3 | 27.8 | 66.5 | 49.1 | 61.0 |
| Sapling & seedling | 35.8 | 2.5 | 2.2 | -- | -- | 2.0 | -- | 2.3 | 5.8 | -- | 7.4 | 4.6 | 5.9 | 3.1 | -- |
| All stands | 355.5 | 2.5 | 2.2 | -- | 2.3 | 2.0 | 4.1 | 8.9 | 15.4 | 6.4 | 19.5 | 46.5 | 90.8 | 71.8 | 83.1 |

(Table 14 continued on next page)

(Table 14 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 6.6 | -- | -- | 1.8 | 2.3 | -- | -- | -- | 2.5 | -- | -- | -- | -- | -- | -- |
| Poletimber | 6.3 | -- | -- | -- | -- | -- | -- | 2.0 | -- | 2.3 | -- | 2.0 | -- | -- | -- |
| Sapling & seedling | 17.7 | -- | -- | 10.9 | -- | -- | -- | 2.6 | 4.2 | -- | -- | -- | -- | -- | -- |
| All stands | 30.6 | -- | -- | 12.7 | 2.3 | -- | -- | 4.6 | 6.7 | 2.3 | -- | 2.0 | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 280.3 | 1.7 | -- | 2.0 | 7.7 | 21.5 | 17.5 | 38.5 | 44.0 | 38.1 | 40.9 | 44.4 | 19.2 | 4.8 | -- |
| Poletimber | 577.9 | -- | 1.1 | -- | 4.3 | 38.3 | 69.2 | 70.7 | 83.3 | 77.9 | 79.9 | 97.1 | 43.4 | 10.7 | 2.0 |
| Sapling & seedling | 209.9 | 32.3 | 44.5 | 28.3 | 30.4 | 32.1 | 22.2 | 14.2 | 1.2 | 1.2 | 3.5 | -- | -- | -- | -- |
| All stands | 1,068.1 | 34.0 | 45.6 | 30.3 | 42.4 | 91.9 | 108.9 | 123.4 | 128.5 | 117.2 | 124.3 | 141.5 | 62.6 | 15.5 | 2.0 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 125.2 | -- | -- | 4.5 | 6.2 | 14.2 | 6.9 | 12.4 | 13.1 | 1.2 | 10.5 | 23.5 | 25.5 | 4.5 | 2.7 |
| Poletimber | 153.6 | -- | 3.8 | 3.4 | 5.8 | 13.2 | 7.4 | 8.4 | 16.7 | 7.2 | 24.6 | 28.5 | 20.9 | 11.4 | 2.3 |
| Sapling & seedling | 137.5 | 17.9 | 10.6 | 18.9 | 22.3 | 27.1 | 18.0 | 7.1 | 6.5 | -- | 4.8 | 4.3 | -- | -- | -- |
| All stands | 416.3 | 17.9 | 14.4 | 26.8 | 34.3 | 54.5 | 32.3 | 27.9 | 36.3 | 8.4 | 39.9 | 56.3 | 46.4 | 15.9 | 5.0 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 470.9 | -- | 2.7 | -- | 6.7 | 20.5 | 17.6 | 28.9 | 52.7 | 33.7 | 71.5 | 107.1 | 98.1 | 24.0 | 7.4 |
| Poletimber | 864.7 | -- | 1.7 | 5.0 | 19.5 | 33.5 | 36.8 | 59.2 | 91.1 | 68.6 | 109.7 | 207.9 | 158.7 | 65.3 | 7.7 |
| Sapling & seedling | 326.8 | 43.8 | 44.1 | 23.9 | 74.2 | 43.1 | 42.7 | 33.3 | 7.6 | 2.6 | 9.4 | 2.1 | -- | -- | -- |
| All stands | 1,662.4 | 43.8 | 48.5 | 28.9 | 100.4 | 97.1 | 97.1 | 121.4 | 151.4 | 104.9 | 190.6 | 317.1 | 256.8 | 89.3 | 15.1 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 310.7 | -- | -- | 1.7 | 11.5 | 19.5 | 11.5 | 28.1 | 38.4 | 20.6 | 37.2 | 46.3 | 55.3 | 24.0 | 16.6 |
| Poletimber | 661.5 | -- | -- | 4.8 | 21.6 | 43.5 | 40.2 | 88.5 | 87.7 | 66.3 | 108.1 | 82.6 | 89.8 | 26.1 | 2.3 |
| Sapling & seedling | 845.3 | 106.7 | 98.4 | 88.9 | 133.7 | 136.0 | 76.4 | 99.7 | 35.1 | 13.6 | 29.1 | 14.5 | 13.2 | -- | -- |
| All stands | 1,817.5 | 106.7 | 98.4 | 95.4 | 166.8 | 199.0 | 128.1 | 216.3 | 161.2 | 100.5 | 174.4 | 143.4 | 158.3 | 50.1 | 18.9 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 4.5 | -- | -- | -- | -- | -- | 2.2 | -- | -- | -- | 2.3 | -- | -- | -- | -- |
| Poletimber | 85.9 | -- | -- | -- | 2.3 | 2.7 | 6.7 | 9.6 | 7.5 | 4.9 | 8.8 | 14.5 | 23.1 | 5.8 | -- |
| Sapling & seedling | 23.5 | 2.3 | 4.5 | 2.2 | 2.2 | 4.1 | 3.0 | 2.5 | -- | -- | 2.7 | -- | -- | -- | -- |
| All stands | 113.9 | 2.3 | 4.5 | 2.2 | 4.5 | 6.8 | 11.9 | 12.1 | 7.5 | 4.9 | 13.8 | 14.5 | 23.1 | 5.8 | -- |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 25.5 | -- | -- | -- | -- | -- | -- | -- | 2.2 | 2.4 | 8.5 | 8.9 | 1.1 | 2.4 | -- |
| Sapling & seedling | 31.7 | 1.1 | 6.0 | 2.4 | 2.4 | 4.3 | -- | -- | 9.4 | .00 | 3.5 | -- | 2.6 | -- | -- |
| All stands | 57.2 | 1.1 | 6.0 | 2.4 | 2.4 | 4.3 | -- | -- | 11.6 | 2.4 | 12.0 | 8.9 | 3.7 | 2.4 | -- |
| Nonstocked | 63.2 | 42.6 | 14.0 | -- | 2.1 | 2.3 | -- | 2.2 | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 1,508.7 | 1.7 | 2.7 | 14.2 | 54.1 | 95.9 | 67.4 | 146.0 | 176.5 | 115.2 | 195.2 | 269.4 | 225.7 | 92.4 | 52.3 |
| Poletimber | 3,137.1 | -- | 6.6 | 21.8 | 63.1 | 188.6 | 191.2 | 290.6 | 373.0 | 284.6 | 396.8 | 532.2 | 468.6 | 219.8 | 100.2 |
| Sapling & seedling | 1,985.9 | 260.0 | 237.0 | 200.2 | 300.8 | 297.1 | 217.1 | 204.8 | 102.8 | 32.5 | 64.5 | 31.7 | 34.3 | 3.1 | -- |
| Nonstocked | 63.2 | 42.6 | 14.0 | -- | 2.1 | 2.3 | -- | 2.2 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 6,694.9 | 304.3 | 260.3 | 236.2 | 420.1 | 583.9 | 475.7 | 643.6 | 652.3 | 432.3 | 656.5 | 833.3 | 728.6 | 315.3 | 152.5 |

Table 15.--Area of commercial forest land by stocking class of growing-stock trees and stand-size class, Northern Lower Peninsula, Michigan, 1980

| Stocking class (percent) | All stands | Stand-size class: Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
|---|---|---|---|---|---|
| Less than 16.7 | 63.2 | -- | -- | -- | 63.2 |
| 16.7 to 60.9 | 772.0 | 153.0 | 242.2 | 376.8 | -- |
| 61.0 to 100.9 | 2,658.4 | 583.9 | 1,227.6 | 846.9 | -- |
| 101.0 to 133.9 | 2,593.3 | 659.7 | 1,356.0 | 577.6 | -- |
| 134.0+ | 608.0 | 112.1 | 311.3 | 184.6 | -- |
| All classes | 6,694.9 | 1,508.7 | 3,137.1 | 1,985.9 | 63.2 |

Table 16.--Area of commercial forest land by stocking class based on selected stand components, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | Stocking classified in terms of: All live trees | Growing-stock trees | Desirable trees | Acceptable trees | Rough and rotten trees |
|---|---|---|---|---|---|
| 0-10 | 14.6 | 28.0 | 6,536.4 | 28.0 | 4,367.5 |
| 11-20 | 34.7 | 56.4 | 120.4 | 56.4 | 1,491.6 |
| 21-30 | 47.6 | 80.6 | 28.2 | 85.7 | 528.3 |
| 31-40 | 66.0 | 126.8 | 5.0 | 136.8 | 194.6 |
| 41-50 | 87.5 | 203.7 | -- | 207.1 | 79.3 |
| 51-60 | 185.0 | 339.7 | 2.2 | 342.2 | 18.9 |
| 61-70 | 380.0 | 459.3 | -- | 475.2 | 7.8 |
| 71-80 | 364.4 | 531.0 | 2.7 | 546.9 | 4.9 |
| 81-90 | 603.6 | 806.1 | -- | 839.3 | 2.0 |
| 91-100 | 798.0 | 862.0 | -- | 904.7 | -- |
| 101-110 | 884.8 | 904.2 | -- | 917.1 | -- |
| 111-120 | 974.0 | 825.9 | -- | 794.8 | -- |
| 121-130 | 904.9 | 676.8 | -- | 646.0 | -- |
| 131-140 | 652.8 | 449.5 | -- | 408.5 | -- |
| 141-150 | 470.3 | 249.4 | -- | 222.5 | -- |
| 151-160 | 216.6 | 95.5 | -- | 83.7 | -- |
| 161+ | 10.1 | -- | -- | -- | -- |
| All classes | 6,694.9 | 6,694.9 | 6,694.9 | 6,694.9 | 6,694.9 |

Table 17.--Area of noncommercial forest land by ownership class, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All areas | Productive-reserved areas[1] | Unproductive areas |
|---|---|---|---|
| National Forest | 13.6 | 4.9 | 8.7 |
| Bureau of Land Management | -- | -- | -- |
| Indian | -- | -- | -- |
| Miscellaneous federal | 25.0 | 21.5 | 3.5 |
| State | 97.0 | 82.4 | 14.6 |
| County and municipal | 3.0 | 3.0 | -- |
| Forest industry | 1.7 | -- | 1.7 |
| Farmer | 31.9 | 16.2 | 15.7 |
| Misc. private-corp. | 18.5 | 6.1 | 12.4 |
| Misc. private-indiv. | 44.0 | 12.9 | 31.1 |
| All owners | 234.7 | 147.0 | 87.7 |

[1] Includes 4.8 thousand acres of productive-deferred areas and 35.2 thousand acres of Christmas tree production areas.

Table 18.--Area of noncommercial forest land by forest type, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All areas | Productive-reserved areas[1] | Unproductive areas |
|---|---|---|---|
| Jack pine | 13.9 | 7.8 | 6.1 |
| Red pine | 5.3 | 5.2 | 0.1 |
| White pine | 2.0 | 0.4 | 1.6 |
| Balsam fir | 5.9 | 3.4 | 2.5 |
| White spruce | 2.3 | 2.3 | -- |
| Black spruce | 0.8 | 0.5 | 0.3 |
| Northern white-cedar | 26.5 | 4.4 | 22.1 |
| Tamarack | 3.9 | 0.1 | 3.8 |
| Oak-hickory | 42.1 | 36.1 | 6.0 |
| Elm-ash-soft maple | 37.1 | 16.2 | 20.9 |
| Maple-birch | 31.0 | 28.0 | 3.0 |
| Aspen | 18.2 | 12.5 | 5.7 |
| Paper birch | 5.0 | -- | 5.0 |
| Exotic | 29.8 | 29.8 | -- |
| Nonstocked | 10.9 | 0.3 | 10.6 |
| All types | 234.7 | 147.0 | 87.7 |

[1] Includes 4.8 thousand acres of productive-deferred areas and 35.2 thousand acres of Christmas tree production areas.

Table 19.--Area of nonforest land with trees by forest type and land use, Northern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All uses | Land use | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cropland | Improved pasture | Wooded strips | Idle farmland | Marsh | Wind-breaks | Urban and other windbreaks | Wooded pasture |
| Jack pine | 10.7 | 4.7 | 2.4 | -- | -- | 1.2 | 2.4 | -- | -- |
| Red pine | 8.9 | -- | 2.3 | 6.6 | -- | -- | -- | -- | -- |
| White pine | 2.2 | -- | -- | -- | -- | 2.2 | -- | -- | -- |
| Balsam fir | 2.5 | -- | -- | -- | -- | 2.5 | -- | -- | -- |
| White spruce | 4.5 | -- | 2.3 | -- | -- | -- | -- | -- | 2.2 |
| Black spruce | 2.3 | -- | -- | -- | -- | 2.3 | -- | -- | -- |
| Northern white-cedar | 6.6 | -- | -- | -- | -- | 6.6 | -- | -- | -- |
| Tamarack | 1.7 | -- | -- | -- | -- | 1.7 | -- | -- | -- |
| Oak-hickory | 38.9 | 13.9 | 22.8 | 2.2 | -- | -- | -- | -- | -- |
| Elm-ash-soft maple | 53.8 | 4.5 | 2.3 | 2.8 | -- | 44.2 | -- | -- | -- |
| Maple-birch | 57.1 | 14.6 | 16.5 | 17.6 | -- | 3.3 | 5.1 | -- | -- |
| Aspen | 50.6 | 9.0 | 13.7 | 4.6 | 2.3 | 21.0 | -- | -- | -- |
| Paper birch | 12.8 | -- | -- | -- | -- | 12.8 | -- | -- | -- |
| Exotic | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 252.6 | 46.7 | 62.3 | 33.8 | 2.3 | 97.8 | 7.5 | -- | 2.2 |

## Table 20.--Number of all live trees on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand trees)

| | | Diameter class (inches at breast height) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All classes | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 74,229 | 42,672 | 16,657 | 5,569 | 3,241 | 1,870 | 1,337 | 957 | 740 | 501 | 292 | 150 | 219 | 23 | 1 |
| Red pine | 212,890 | 43,079 | 65,548 | 66,286 | 24,576 | 7,498 | 2,936 | 1,164 | 831 | 575 | 228 | 133 | 36 | -- | -- |
| Jack pine | 240,475 | 92,871 | 62,870 | 45,690 | 25,241 | 10,448 | 2,354 | 830 | 144 | 23 | 4 | -- | -- | -- | -- |
| White spruce | 14,006 | 3,980 | 4,160 | 3,151 | 1,220 | 856 | 341 | 179 | 67 | 27 | 13 | 10 | 2 | -- | -- |
| Black spruce | 30,862 | 13,001 | 9,505 | 4,993 | 2,559 | 675 | 98 | 25 | 6 | -- | -- | -- | -- | -- | -- |
| Balsam fir | 157,596 | 95,136 | 34,412 | 17,844 | 7,294 | 2,251 | 516 | 104 | 39 | -- | -- | -- | -- | -- | -- |
| Hemlock | 28,861 | 9,752 | 9,145 | 4,279 | 2,572 | 1,149 | 770 | 602 | 239 | 184 | 84 | 35 | 50 | -- | -- |
| Tamarack | 32,764 | 14,880 | 11,646 | 4,060 | 1,321 | 560 | 217 | 64 | 13 | -- | -- | 3 | -- | -- | -- |
| Northern white-cedar | 346,490 | 119,700 | 107,521 | 70,005 | 31,708 | 11,979 | 3,631 | 1,416 | 377 | 91 | 55 | 7 | -- | -- | -- |
| Other softwoods | 48,770 | 13,145 | 22,997 | 9,968 | 2,346 | 289 | -- | 22 | -- | -- | 3 | -- | -- | -- | -- |
| Total | 1,186,943 | 448,216 | 344,461 | 231,845 | 102,078 | 37,575 | 12,200 | 5,363 | 2,456 | 1,401 | 679 | 338 | 307 | 23 | 1 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 93,778 | 29,690 | 26,550 | 15,968 | 10,034 | 5,601 | 3,258 | 1,228 | 721 | 373 | 180 | 103 | 59 | 13 | -- |
| Select red oaks | 184,684 | 82,093 | 22,993 | 24,728 | 21,690 | 15,450 | 8,546 | 4,265 | 2,366 | 1,417 | 570 | 286 | 235 | 42 | 3 |
| Other red oaks | 46,854 | 14,925 | 6,577 | 10,621 | 6,383 | 4,206 | 2,061 | 991 | 492 | 383 | 93 | 57 | 59 | 6 | -- |
| Hickory | 941 | -- | 761 | -- | 76 | 54 | 36 | 9 | -- | 5 | -- | -- | -- | -- | -- |
| Yellow birch | 14,892 | 4,096 | 4,596 | 2,773 | 1,414 | 1,052 | 566 | 188 | 131 | 49 | 12 | 10 | 5 | -- | -- |
| Hard maple | 456,684 | 247,472 | 108,653 | 51,407 | 25,800 | 12,779 | 5,571 | 2,691 | 1,246 | 526 | 262 | 106 | 150 | 20 | 1 |
| Soft maple | 497,187 | 271,109 | 109,399 | 58,005 | 30,606 | 15,114 | 7,005 | 3,099 | 1,455 | 699 | 392 | 138 | 141 | 18 | 7 |
| Beech | 53,254 | 31,598 | 8,062 | 5,603 | 2,782 | 1,855 | 916 | 920 | 587 | 436 | 247 | 131 | 107 | 10 | -- |
| Ash | 230,160 | 139,386 | 48,271 | 22,838 | 9,925 | 5,175 | 2,542 | 1,207 | 510 | 199 | 57 | 21 | 22 | 5 | 2 |
| Balsam poplar | 39,500 | 24,187 | 5,001 | 3,029 | 2,722 | 1,559 | 1,181 | 865 | 532 | 239 | 116 | 52 | 12 | 5 | -- |
| Cottonwood | 690 | -- | -- | 167 | 175 | 117 | 89 | 50 | 29 | 14 | 26 | 13 | 7 | -- | 3 |
| Bigtooth aspen | 323,398 | 178,209 | 56,183 | 32,607 | 25,267 | 17,102 | 9,018 | 3,218 | 1,196 | 412 | 101 | 49 | 36 | -- | -- |
| Quaking aspen | 523,146 | 352,549 | 75,459 | 39,396 | 25,377 | 15,818 | 8,621 | 3,619 | 1,590 | 482 | 184 | 43 | 8 | -- | -- |
| Basswood | 52,396 | 10,905 | 5,905 | 11,188 | 9,505 | 7,869 | 3,834 | 1,914 | 765 | 317 | 112 | 46 | 31 | 5 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 17 | -- | -- | -- | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 83,870 | 53,218 | 12,733 | 8,299 | 4,937 | 2,709 | 932 | 659 | 257 | 59 | 41 | 24 | 2 | -- | -- |
| Butternut | 15 | -- | -- | -- | -- | -- | -- | 15 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 55,885 | 37,322 | 11,512 | 3,931 | 1,733 | 880 | 343 | 73 | 61 | 22 | 8 | -- | -- | -- | -- |
| Paper birch | 104,330 | 29,550 | 26,001 | 25,720 | 14,082 | 6,057 | 2,018 | 591 | 246 | 52 | 13 | -- | -- | -- | -- |
| Other hardwoods | 16,069 | 11,244 | 3,159 | 911 | 216 | 208 | 136 | 81 | 38 | 26 | 25 | 13 | 11 | 1 | -- |
| Noncommercial species | 105,041 | 83,915 | 13,798 | 5,538 | 1,301 | 396 | 80 | 9 | -- | -- | 4 | -- | -- | -- | -- |
| Total | 2,882,791 | 1,601,468 | 545,613 | 322,729 | 194,025 | 114,018 | 56,753 | 25,692 | 12,222 | 5,710 | 2,443 | 1,092 | 885 | 125 | 16 |
| All species | 4,069,734 | 2,049,684 | 890,074 | 554,574 | 296,103 | 151,593 | 68,953 | 31,055 | 14,678 | 7,111 | 3,122 | 1,430 | 1,192 | 148 | 17 |

Table 21.--Number of growing-stock trees on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 72,416 | 42,143 | 16,371 | 5,212 | 3,030 | 1,712 | 1,163 | 914 | 699 | 501 | 292 | 142 | 213 | 23 | 1 |
| Red pine | 209,751 | 42,084 | 64,932 | 65,165 | 24,319 | 7,404 | 2,896 | 1,164 | 831 | 563 | 224 | 133 | 36 | -- | -- |
| Jack pine | 217,042 | 81,759 | 57,096 | 41,194 | 24,035 | 9,882 | 2,298 | 621 | 130 | 23 | 4 | -- | -- | -- | -- |
| White spruce | 13,476 | 3,978 | 3,929 | 2,899 | 1,220 | 818 | 341 | 172 | 67 | 27 | 13 | 10 | 2 | -- | -- |
| Black spruce | 30,084 | 12,697 | 9,305 | 4,817 | 2,475 | 675 | 84 | 25 | 6 | -- | -- | -- | -- | -- | -- |
| Balsam fir | 153,463 | 92,281 | 33,717 | 17,545 | 7,086 | 2,193 | 498 | 104 | 39 | -- | -- | -- | -- | -- | -- |
| Hemlock | 26,846 | 9,172 | 8,895 | 3,635 | 2,341 | 1,032 | 706 | 522 | 216 | 170 | 84 | 31 | 42 | -- | -- |
| Tamarack | 29,194 | 13,048 | 10,745 | 3,476 | 1,147 | 500 | 207 | 55 | 13 | -- | -- | 3 | -- | -- | -- |
| Northern white-cedar | 313,223 | 108,772 | 99,341 | 63,042 | 28,010 | 9,744 | 2,860 | 1,074 | 283 | 62 | 28 | 7 | -- | -- | -- |
| Other softwoods | 40,975 | 10,435 | 20,663 | 7,758 | 1,860 | 234 | -- | 22 | -- | -- | 3 | -- | -- | -- | -- |
| Total | 1,106,470 | 416,369 | 324,994 | 214,743 | 95,523 | 34,194 | 11,053 | 4,673 | 2,284 | 1,346 | 648 | 326 | 293 | 23 | 1 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 84,370 | 26,866 | 23,249 | 14,014 | 9,616 | 5,300 | 2,998 | 1,100 | 642 | 313 | 161 | 68 | 37 | 6 | -- |
| Select red oaks | 175,671 | 79,315 | 21,473 | 23,413 | 20,792 | 14,314 | 7,829 | 3,924 | 2,251 | 1,306 | 537 | 266 | 215 | 33 | 3 |
| Other red oaks | 39,432 | 12,235 | 5,581 | 8,613 | 5,495 | 3,764 | 1,866 | 870 | 456 | 359 | 87 | 51 | 49 | 6 | -- |
| Hickory | 941 | -- | 761 | -- | 76 | 54 | 36 | 9 | -- | 5 | -- | -- | -- | -- | -- |
| Yellow birch | 13,378 | 4,096 | 4,367 | 2,248 | 1,167 | 802 | 407 | 138 | 92 | 43 | 8 | 7 | 3 | -- | -- |
| Hard maple | 430,159 | 227,668 | 106,778 | 49,604 | 24,307 | 12,094 | 5,184 | 2,487 | 1,147 | 466 | 223 | 93 | 97 | 10 | 1 |
| Soft maple | 473,943 | 258,126 | 105,308 | 55,588 | 29,171 | 14,070 | 6,408 | 2,808 | 1,268 | 621 | 347 | 99 | 110 | 12 | 7 |
| Beech | 50,283 | 31,002 | 8,009 | 4,817 | 2,435 | 1,546 | 696 | 712 | 442 | 319 | 171 | 88 | 41 | 5 | -- |
| Ash | 213,281 | 131,347 | 43,426 | 20,257 | 9,074 | 4,925 | 2,346 | 1,138 | 484 | 187 | 53 | 21 | 18 | 5 | -- |
| Balsam poplar | 36,872 | 22,855 | 4,558 | 2,824 | 2,546 | 1,426 | 1,031 | 763 | 469 | 221 | 116 | 49 | 9 | 5 | -- |
| Cottonwood | 633 | -- | -- | 123 | 174 | 117 | 89 | 50 | 29 | 9 | 26 | 6 | 7 | -- | 3 |
| Bigtooth aspen | 300,375 | 166,505 | 51,651 | 29,379 | 23,868 | 16,403 | 8,252 | 2,899 | 922 | 362 | 87 | 25 | 22 | -- | -- |
| Quaking aspen | 485,409 | 334,669 | 66,585 | 34,062 | 23,150 | 14,479 | 7,606 | 3,059 | 1,287 | 366 | 124 | 19 | 3 | -- | -- |
| Basswood | 49,953 | 10,216 | 5,785 | 10,359 | 9,159 | 7,723 | 3,699 | 1,836 | 722 | 306 | 87 | 35 | 21 | 5 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 17 | -- | -- | -- | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 68,965 | 46,822 | 9,823 | 5,043 | 3,649 | 2,067 | 734 | 544 | 176 | 54 | 33 | 18 | 2 | -- | -- |
| Butternut | 15 | -- | -- | -- | -- | -- | -- | 15 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 50,258 | 34,470 | 9,910 | 3,297 | 1,459 | 670 | 320 | 50 | 56 | 22 | 4 | -- | -- | -- | -- |
| Paper birch | 94,864 | 26,066 | 23,988 | 23,457 | 13,186 | 5,635 | 1,738 | 520 | 228 | 38 | 8 | -- | -- | -- | -- |
| Other hardwoods | 11,429 | 8,159 | 2,128 | 552 | 168 | 176 | 90 | 65 | 32 | 22 | 20 | 10 | 7 | -- | -- |
| Total | 2,580,248 | 1,420,417 | 493,380 | 287,650 | 179,492 | 105,582 | 51,329 | 22,987 | 10,703 | 5,019 | 2,092 | 855 | 641 | 87 | 14 |
| All species | 3,686,718 | 1,836,786 | 818,374 | 502,393 | 275,015 | 139,776 | 62,382 | 27,660 | 12,987 | 6,365 | 2,740 | 1,181 | 934 | 110 | 15 |

Table 22.--Number of short-log trees on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand trees)

| | | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All classes | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 216 | 107 | 66 | 18 | 21 | -- | -- | 4 | -- | -- | -- |
| Red pine | 33 | 14 | 13 | -- | -- | 6 | -- | -- | -- | -- | -- |
| Jack pine | 345 | 268 | 21 | 50 | 6 | -- | -- | -- | -- | -- | -- |
| White spruce | 20 | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 24 | 17 | 7 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 112 | 67 | -- | 33 | 7 | -- | -- | -- | 5 | -- | -- |
| Tamarack | 58 | 48 | 10 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 1,006 | 623 | 234 | 104 | 22 | 20 | 3 | -- | -- | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,814 | 1,164 | 351 | 205 | 56 | 26 | 3 | 4 | 5 | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 292 | -- | 156 | 67 | 33 | -- | 12 | 7 | 14 | 3 | -- |
| Select red oaks | 640 | -- | 357 | 140 | 46 | 65 | 13 | 7 | 5 | 7 | -- |
| Other red oaks | 111 | -- | 45 | 36 | 21 | 5 | -- | -- | 4 | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 115 | -- | 73 | 17 | 25 | -- | -- | -- | -- | -- | -- |
| Hard maple | 395 | -- | 201 | 61 | 38 | 27 | 22 | 7 | 33 | 6 | -- |
| Soft maple | 549 | -- | 272 | 110 | 87 | 31 | 19 | 22 | 8 | -- | -- |
| Beech | 214 | -- | 31 | 67 | 22 | 30 | 13 | 21 | 25 | 5 | -- |
| Ash | 104 | -- | 75 | 8 | 14 | 5 | -- | -- | -- | -- | 2 |
| Balsam poplar | 39 | -- | 28 | -- | 7 | 4 | -- | -- | -- | -- | -- |
| Cottonwood | 3 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | -- |
| Bigtooth aspen | 328 | -- | 172 | 78 | 47 | 16 | 7 | 3 | 5 | -- | -- |
| Quaking aspen | 379 | -- | 213 | 63 | 56 | 27 | 8 | 10 | 2 | -- | -- |
| Basswood | 122 | -- | 58 | 28 | 14 | 10 | 9 | 3 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 82 | -- | 38 | 18 | 18 | -- | 8 | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 36 | -- | 8 | 24 | -- | -- | 4 | -- | -- | -- | -- |
| Paper birch | 150 | -- | 115 | 19 | 6 | 5 | 5 | -- | -- | -- | -- |
| Other hardwoods | 5 | -- | -- | -- | -- | 5 | -- | -- | -- | -- | -- |
| Total | 3,564 | -- | 1,842 | 736 | 434 | 230 | 120 | 83 | 96 | 21 | 2 |
| All species | 5,378 | 1,164 | 2,193 | 941 | 490 | 256 | 123 | 87 | 101 | 21 | 2 |

Table 23.--Net volume of growing stock on commercial forest land by species group, Northern Lower Peninsula, Michigan, 1966 and 1980

(In million cubic feet)

| Species group | 1966[1] | 1980 |
|---|---|---|
| SOFTWOODS | | |
| White pine | 89.5 | 176.8 |
| Red pine | 116.7 | 452.5 |
| Jack pine | 188.8 | 335.9 |
| White spruce | 32.7 | 38.7 |
| Black spruce | 24.7 | 36.0 |
| Balsam fir | 145.8 | 115.9 |
| Hemlock | 74.9 | 65.0 |
| Tamarack | 23.2 | 26.8 |
| Northern white-cedar | 330.8 | 431.1 |
| Other softwoods | -- | 28.4 |
| Total | 1,027.1 | 1,707.1 |
| HARDWOODS | | |
| Select white oak | 211.4 | 251.2 |
| Select red oak | 404.2 | 721.4 |
| Other red oak | 255.9 | 180.2 |
| Hickory | 4.0 | 1.8 |
| Yellow birch | 40.9 | 37.6 |
| Hard maple | 464.5 | 693.0 |
| Soft maple | 341.9 | 748.3 |
| Beech | 158.1 | 121.7 |
| Ash | 189.2 | 251.9 |
| Balsam poplar | 81.1 | 98.1 |
| Cottonwood | 26.2 | 10.3 |
| Bigtooth aspen | 453.3 | 653.6 |
| Quaking aspen | 472.0 | 630.9 |
| Basswood | 225.9 | 325.2 |
| Yellow-poplar | -- | -- |
| Black walnut | -- | 0.2 |
| Black cherry | 47.8 | 94.1 |
| Butternut | -- | 0.3 |
| Elm | 297.6 | 30.1 |
| Paper birch | 233.6 | 257.0 |
| Other hardwoods | 10.3 | 10.7 |
| Total | 3,917.9 | 5,117.6 |
| All species | 4,945.0 | 6,824.7 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

Table 24.--Net volume of all live trees on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 181,415 | 10,943 | 15,199 | 15,553 | 18,400 | 20,864 | 22,629 | 22,028 | 17,044 | 10,652 | 23,508 | 4,120 | 475 |
| Red pine | 456,084 | 139,935 | 117,990 | 67,265 | 43,146 | 24,964 | 23,897 | 20,498 | 9,708 | 6,608 | 2,073 | -- | -- |
| Jack pine | 350,545 | 96,385 | 119,898 | 86,112 | 29,963 | 13,910 | 3,387 | 725 | 165 | -- | -- | -- | -- |
| White spruce | 39,280 | 7,678 | 6,958 | 8,978 | 6,020 | 4,339 | 2,389 | 1,266 | 775 | 699 | 178 | -- | -- |
| Black spruce | 36,475 | 13,295 | 14,103 | 6,664 | 1,492 | 659 | 262 | -- | -- | -- | -- | -- | -- |
| Balsam fir | 117,367 | 42,972 | 39,323 | 22,336 | 8,645 | 2,621 | 1,470 | -- | -- | -- | -- | -- | -- |
| Hemlock | 69,150 | 8,440 | 10,576 | 8,379 | 8,759 | 10,379 | 5,949 | 6,625 | 3,900 | 2,091 | 4,052 | -- | -- |
| Tamarack | 28,800 | 10,525 | 6,966 | 5,455 | 3,678 | 1,350 | 570 | -- | -- | 256 | -- | -- | -- |
| Northern white-cedar | 479,790 | 167,257 | 146,110 | 89,676 | 41,174 | 22,826 | 8,047 | 2,603 | 1,752 | 345 | -- | -- | -- |
| Other softwoods | 33,417 | 20,494 | 10,308 | 2,117 | -- | 379 | -- | -- | 119 | -- | -- | -- | -- |
| Total | 1,792,323 | 517,924 | 487,431 | 312,535 | 161,277 | 102,291 | 68,600 | 53,745 | 33,463 | 20,651 | 29,811 | 4,120 | 475 |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 270,861 | 45,274 | 57,409 | 51,614 | 44,651 | 23,332 | 18,585 | 12,171 | 7,760 | 4,981 | 3,774 | 1,310 | -- |
| Select red oaks | 757,085 | 63,141 | 119,763 | 150,258 | 130,365 | 95,170 | 72,575 | 56,141 | 28,615 | 17,201 | 18,123 | 5,146 | 587 |
| Other red oaks | 197,094 | 24,471 | 35,975 | 40,244 | 31,364 | 21,936 | 15,007 | 15,258 | 4,505 | 3,357 | 4,264 | 713 | -- |
| Hickory | 1,837 | -- | 437 | 464 | 558 | 181 | -- | 197 | -- | -- | -- | -- | -- |
| Yellow birch | 43,334 | 7,941 | 8,090 | 9,678 | 7,652 | 3,632 | 3,431 | 1,663 | 520 | 445 | 282 | -- | -- |
| Hard maple | 726,600 | 172,450 | 170,631 | 140,909 | 91,496 | 61,276 | 38,204 | 20,173 | 12,128 | 6,142 | 10,854 | 2,151 | 186 |
| Soft maple | 790,223 | 157,908 | 177,826 | 156,309 | 112,416 | 71,245 | 44,484 | 28,642 | 19,383 | 7,815 | 10,715 | 2,143 | 1,337 |
| Beech | 149,085 | 18,106 | 17,814 | 18,906 | 14,425 | 20,358 | 16,860 | 16,328 | 11,071 | 6,912 | 7,258 | 1,047 | -- |
| Ash | 266,091 | 61,387 | 56,273 | 52,687 | 39,530 | 26,601 | 15,361 | 7,845 | 2,587 | 1,210 | 1,621 | 697 | 292 |
| Balsam poplar | 104,094 | 8,207 | 14,531 | 14,339 | 16,229 | 17,196 | 14,743 | 8,836 | 5,404 | 3,084 | 926 | 599 | -- |
| Cottonwood | 10,771 | 534 | 952 | 1,224 | 1,373 | 1,144 | 956 | 494 | 1,416 | 691 | 721 | -- | 1,266 |
| Bigtooth aspen | 688,650 | 86,670 | 147,852 | 179,718 | 143,068 | 72,739 | 33,699 | 15,516 | 4,858 | 2,376 | 2,154 | -- | -- |
| Quaking aspen | 681,823 | 99,062 | 144,552 | 159,531 | 130,872 | 76,868 | 44,209 | 16,808 | 7,502 | 1,979 | 440 | -- | -- |
| Basswood | 335,574 | 36,296 | 61,293 | 84,758 | 61,812 | 43,613 | 23,673 | 13,312 | 5,411 | 2,574 | 2,223 | 609 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 200 | -- | -- | 200 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 117,002 | 21,744 | 29,214 | 26,019 | 14,425 | 13,921 | 6,858 | 1,884 | 1,679 | 1,134 | 124 | -- | -- |
| Butternut | 278 | -- | -- | -- | -- | 278 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 35,142 | 9,309 | 9,170 | 7,416 | 4,981 | 1,425 | 1,691 | 833 | 317 | -- | -- | -- | -- |
| Paper birch | 273,966 | 72,768 | 87,177 | 62,689 | 30,744 | 12,074 | 6,599 | 1,478 | 437 | -- | -- | -- | -- |
| Other hardwoods | 13,282 | 2,010 | 810 | 1,985 | 1,972 | 1,706 | 1,070 | 899 | 1,167 | 708 | 866 | 89 | -- |
| Noncommercial species | 22,154 | 12,525 | 5,784 | 2,918 | 736 | 63 | -- | -- | 128 | -- | -- | -- | -- |
| Total | 5,485,146 | 899,803 | 1,145,553 | 1,161,866 | 878,669 | 564,758 | 358,005 | 218,478 | 114,888 | 60,609 | 64,345 | 14,504 | 3,668 |
| All species | 7,277,469 | 1,417,727 | 1,632,984 | 1,474,401 | 1,039,946 | 667,049 | 426,605 | 272,223 | 148,351 | 81,260 | 94,156 | 18,624 | 4,143 |

Table 25.--Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Class of timber | All species | Softwoods | Hardwoods |
|---|---|---|---|
| LIVE TREES | | | |
| Growing-stock trees | | | |
| Sawtimber | | | |
| Saw log portion | 2,361,147 | 659,068 | 1,702,079 |
| Upper stem portion | 486,205 | 89,066 | 397,139 |
| Subtotal | 2,847,352 | 748,134 | 2,099,218 |
| Poletimber | 3,977,314 | 958,917 | 3,018,397 |
| Total growing-stock | 6,824,666 | 1,707,051 | 5,117,615 |
| Cull trees | | | |
| Rough and rotten trees | | | |
| Sawtimber | 143,444 | 24,913 | 118,531 |
| Poletimber | 231,359 | 46,440 | 184,919 |
| Subtotal | 374,803 | 71,353 | 303,450 |
| Short-log trees | 78,000 | 13,919 | 64,081 |
| Total cull | 452,803 | 85,271 | 367,532 |
| TOTAL LIVE TREES | 7,277,469 | 1,792,323 | 5,485,146 |
| SALVABLE DEAD TREES | 230,467 | 54,473 | 175,994 |
| ALL CLASSES | 7,507,936 | 1,846,796 | 5,661,140 |

Table 26.--Net volume of growing stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species, Northern Lower Peninsula, Michigan, 1980

| Species | Total all live | Growing stock | Short-log cull | Rough and rotten cull | Sawtimber |
|---|---|---|---|---|---|
| | -Thousand cubic feet- | | | | Thousand board feet[1] |
| SOFTWOODS | | | | | |
| White pine | 181,415 | 176,763 | 1,535 | 3,117 | 811,402 |
| Red pine | 456,084 | 452,495 | 260 | 3,329 | 1,053,736 |
| Jack pine | 350,545 | 335,918 | 1,959 | 12,668 | 684,828 |
| Scotch pine | 27,090 | 22,918 | -- | 4,172 | 8,532 |
| Austrian pine | 5,667 | 4,850 | -- | 817 | 1,315 |
| White spruce | 39,280 | 38,705 | 67 | 508 | 121,852 |
| Norway spruce | 281 | 281 | -- | -- | -- |
| Engelmann spruce | -- | -- | -- | -- | -- |
| Black spruce | 36,475 | 35,972 | -- | 503 | 41,690 |
| Balsam fir | 117,367 | 115,899 | 132 | 1,336 | 151,930 |
| Hemlock | 69,150 | 64,960 | 835 | 3,355 | 252,871 |
| Tamarack | 28,800 | 26,795 | 332 | 1,673 | 56,260 |
| Northern white-cedar | 479,790 | 431,116 | 8,799 | 39,875 | 653,206 |
| Eastern redcedar | 379 | 379 | -- | -- | 1,800 |
| Total | 1,792,323 | 1,707,051 | 13,919 | 71,353 | 3,839,422 |
| HARDWOODS | | | | | |
| White oak | 264,746 | 245,910 | 4,919 | 13,917 | 555,386 |
| Bur oak | 3,098 | 2,505 | 314 | 279 | 6,291 |
| Swamp white oak | 2,906 | 2,745 | -- | 161 | 10,517 |
| Chestnut oak | 112 | -- | -- | 112 | -- |
| Northern red oak | 757,086 | 721,458 | 10,815 | 24,813 | 2,159,690 |
| Scarlet oak | 1,093 | 1,093 | -- | -- | 873 |
| Northern pin oak | 54,628 | 52,295 | 588 | 1,745 | 168,375 |
| Black oak | 141,372 | 126,801 | 1,342 | 13,229 | 318,854 |
| Bitternut hickory | 1,204 | 1,204 | -- | -- | 4,625 |
| Shellbark hickory | -- | -- | -- | -- | -- |
| Shagbark hickory | 633 | 633 | -- | -- | 963 |
| Yellow birch | 43,334 | 37,604 | 1,325 | 4,405 | 77,578 |
| Black maple | -- | -- | -- | -- | -- |
| Sugar maple | 726,599 | 692,984 | 9,176 | 24,439 | 1,188,575 |
| Red maple | 748,986 | 708,539 | 9,712 | 30,735 | 1,293,221 |
| Silver maple | 41,237 | 39,816 | 310 | 1,111 | 156,852 |
| Beech | 149,085 | 121,689 | 6,311 | 21,085 | 389,470 |
| White ash | 152,226 | 148,096 | 1,476 | 2,654 | 377,159 |
| Black ash | 82,344 | 74,255 | 234 | 7,855 | 59,151 |
| Green ash | 31,521 | 29,541 | 138 | 1,842 | 51,125 |
| Honeylocust | 559 | 466 | -- | 93 | -- |
| Balsam poplar | 104,094 | 98,083 | 465 | 5,546 | 353,766 |
| Paper birch | 273,966 | 256,960 | 2,117 | 14,889 | 233,758 |
| Bigtooth aspen | 688,651 | 653,639 | 5,006 | 30,006 | 1,339,410 |
| Quaking aspen | 681,824 | 630,943 | 5,383 | 45,498 | 1,366,066 |
| Basswood | 335,575 | 325,173 | 2,124 | 8,278 | 834,832 |
| American elm | 31,929 | 27,234 | 561 | 4,134 | 37,263 |
| Slippery elm | 896 | 807 | -- | 89 | 1,089 |
| Rock elm | 2,315 | 2,077 | 135 | 103 | 5,778 |
| American chestnut | 296 | 110 | -- | 186 | -- |
| Butternut | 278 | 278 | -- | -- | 1,427 |
| Red mulberry | 97 | 97 | -- | -- | -- |
| Black tupelo | 968 | 714 | -- | 254 | 883 |
| Sycamore | 617 | 617 | -- | -- | 3,172 |
| Black walnut | 200 | 200 | -- | -- | -- |
| Black cherry | 117,000 | 94,087 | 1,396 | 21,517 | 172,403 |
| Boxelder | -- | -- | -- | -- | -- |
| River birch | 336 | 336 | -- | -- | 878 |
| Eastern cottonwood | 10,772 | 10,261 | 92 | 419 | 42,830 |
| Black willow | 7,076 | 6,385 | 142 | 549 | 25,904 |
| Sassafras | 3,333 | 1,980 | -- | 1,353 | 4,596 |
| Noncommercial species | 22,154 | -- | -- | 22,154 | -- |
| Total | 5,485,146 | 5,117,615 | 64,081 | 303,450 | 11,242,760 |
| All species | 7,277,469 | 6,824,666 | 78,000 | 374,803 | 15,082,182 |

[1] International 1/4-inch rule.

Table 27.--Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species | Nongrowing-stock (rough tree) volume |
|---|---|
| Striped maple | 263 |
| Mountain maple | -- |
| Ailanthus | -- |
| American hornbeam | 126 |
| Eastern hophornbeam | 17,891 |
| Eastern redbud | -- |
| Hawthorn | 273 |
| Apple | 1,486 |
| Pin cherry | 560 |
| Chokecherry | 888 |
| Mountain ash | 81 |
| Peachleaf willow | 586 |
| Diamond willow | -- |
| All species | 22,154 |

Table 28.--Net volume of growing stock on commercial forest land by species group and county, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 176,763 | 7,923 | 6,397 | 1,352 | 1,207 | -- | 360 | 5,406 | 10,125 | 4,923 | 5,034 | 1,370 |
| Red pine | 452,495 | 17,447 | 5,509 | 509 | 665 | -- | 9,031 | 4,289 | 17,727 | 10,518 | 20,959 | 1,879 |
| Jack pine | 335,918 | 15,092 | 2,388 | -- | 4,813 | -- | -- | 868 | 11,429 | 14,777 | 48,354 | -- |
| White spruce | 38,705 | 2,730 | 8,499 | 153 | -- | -- | -- | 3,493 | 9,772 | -- | -- | 866 |
| Black spruce | 35,972 | 1,766 | 243 | 1,692 | -- | -- | 420 | 1,843 | 5,153 | -- | 2,100 | 2,645 |
| Balsam fir | 115,899 | 8,659 | 15,464 | 2,681 | 1,853 | -- | 359 | 5,405 | 13,870 | 1,872 | 2,305 | 5,897 |
| Hemlock | 64,960 | 900 | 523 | 4,118 | -- | -- | 3,219 | 2,335 | 3,019 | 240 | 906 | 2,926 |
| Tamarack | 26,795 | 142 | 1,002 | 299 | 360 | -- | 1,385 | 914 | 2,283 | 1,574 | 389 | 2,176 |
| Northern white-cedar | 431,116 | 16,470 | 30,438 | 10,369 | 2,299 | -- | 2,960 | 25,800 | 40,998 | 9,898 | 6,567 | 12,099 |
| Other softwoods | 28,428 | 141 | 137 | 1,608 | 1,946 | -- | 2,102 | -- | 78 | -- | 47 | -- |
| Total | 1,707,051 | 71,270 | 70,600 | 22,781 | 13,143 | -- | 19,836 | 50,353 | 114,454 | 43,802 | 86,661 | 29,858 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 251,160 | 11,700 | 1,794 | -- | 660 | 326 | 164 | -- | 1,057 | 13,414 | 12,575 | -- |
| Select red oaks | 721,458 | 63,031 | 20,206 | -- | 8,389 | 101 | 814 | 2,808 | 10,198 | 29,945 | 57,480 | 5,729 |
| Other red oaks | 180,189 | 13,787 | -- | -- | 1,921 | -- | -- | -- | 1,411 | 11,455 | 9,018 | -- |
| Hickory | 1,838 | -- | -- | -- | -- | -- | -- | -- | -- | 197 | -- | -- |
| Yellow birch | 37,604 | 396 | -- | 2,389 | 343 | -- | 2,335 | 5,584 | 1,623 | -- | -- | 2,599 |
| Hard maple | 692,984 | 7,547 | 2,760 | 60,526 | 677 | -- | 47,710 | 51,006 | 50,720 | 1,838 | 10,422 | 77,468 |
| Soft maple | 748,355 | 28,078 | 22,506 | 20,066 | 15,710 | 3,835 | 23,314 | 10,929 | 22,792 | 31,427 | 12,344 | 16,725 |
| Beech | 121,689 | 4,576 | -- | 8,343 | 377 | -- | 7,852 | 8,134 | 7,474 | 2,184 | 3,038 | 17,590 |
| Ash | 251,892 | 12,130 | 7,483 | 7,451 | 12,685 | 4,775 | 5,643 | 12,456 | 7,274 | 4,820 | 439 | 10,739 |
| Balsam poplar | 98,083 | 14,379 | 12,756 | 1,585 | 817 | -- | -- | 2,274 | 10,000 | 1,128 | 1,279 | 5,292 |
| Cottonwood | 10,261 | -- | -- | -- | 775 | 881 | -- | -- | -- | 443 | -- | -- |
| Bigtooth aspen | 653,639 | 30,198 | 39,926 | 24,528 | 17,136 | 4,125 | 5,753 | 10,043 | 33,839 | 25,756 | 15,528 | 25,662 |
| Quaking aspen | 630,943 | 28,576 | 28,402 | 10,063 | 17,839 | 1,842 | 7,359 | 14,611 | 47,920 | 22,183 | 11,759 | 31,025 |
| Basswood | 325,173 | 10,539 | 1,803 | 36,759 | 1,057 | 1,120 | 12,692 | 34,439 | 34,246 | 659 | 4,497 | 17,642 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 94,087 | 3,429 | 263 | 2,576 | 485 | -- | 7,192 | 646 | 186 | 3,615 | 887 | 7,136 |
| Butternut | 278 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 30,117 | 387 | 329 | 4,438 | 660 | 197 | 261 | 1,821 | 2,008 | 78 | 169 | 657 |
| Paper birch | 256,960 | 13,080 | 20,610 | 2,983 | 5,404 | 2,360 | 2,666 | 18,177 | 20,802 | 5,533 | 3,040 | 8,866 |
| Other hardwoods | 10,705 | 319 | -- | -- | 804 | -- | -- | -- | 162 | 311 | 110 | -- |
| Total | 5,117,615 | 242,152 | 158,838 | 181,707 | 85,739 | 19,562 | 123,755 | 172,928 | 251,712 | 154,986 | 142,585 | 227,130 |
| All species | 6,824,666 | 313,422 | 229,438 | 204,488 | 98,882 | 19,562 | 143,591 | 223,281 | 366,166 | 198,788 | 229,246 | 256,988 |

(Table 28 continued on next page)

(Table 28 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 4,541 | 5,884 | 6,455 | 414 | 4,878 | 12,641 | 2,490 | 5,791 | 2,601 | 4,832 | 5,637 | 7,936 |
| Red pine | 2,212 | 17,848 | 39,979 | 387 | 23,237 | 41,847 | 2,165 | 19,430 | 9,876 | 3,135 | 2,557 | 6,257 |
| Jack pine | 1,996 | 6,966 | 24,882 | -- | 14,151 | 24,498 | -- | 7,580 | 6,353 | 359 | 114 | 2,805 |
| White spruce | -- | -- | 2,227 | 113 | 96 | -- | -- | -- | -- | 936 | -- | 285 |
| Black spruce | -- | 184 | 599 | -- | 2,039 | 114 | 134 | 89 | 114 | 1 | -- | 989 |
| Balsam fir | 1,053 | -- | 4,415 | -- | 4,930 | 165 | 261 | 274 | 164 | 1 | -- | 2,772 |
| Hemlock | 199 | 3,448 | 2,047 | 1,972 | 2,033 | 2,903 | 1,602 | 1,854 | 1,297 | 2,662 | 1,234 | 884 |
| Tamarack | -- | 3,612 | 2,196 | 350 | 108 | 8 | 596 | 1,046 | 5 | -- | -- | 1,023 |
| Northern white-cedar | 1,184 | 11,306 | 20,134 | 4,716 | 8,259 | 12,703 | 4,698 | 6,884 | 4,153 | 5,043 | -- | 10,824 |
| Other softwoods | -- | 423 | 43 | 2,428 | 1,151 | 2,900 | -- | 440 | 3,332 | 568 | -- | 2,448 |
| Total | 11,185 | 49,671 | 102,977 | 10,380 | 60,882 | 97,779 | 11,946 | 43,388 | 27,895 | 17,537 | 9,542 | 36,223 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 3,839 | 8,671 | 4,294 | 4,661 | 1,355 | 41,318 | -- | 16,370 | 18,438 | 4,546 | 9,492 | 4,601 |
| Select red oaks | 11,357 | 11,265 | 11,195 | 8,098 | 14,330 | 58,479 | 3,315 | 21,201 | 18,351 | 5,456 | 11,289 | 21,958 |
| Other red oaks | 2,262 | 173 | 12,916 | 788 | -- | 25,150 | -- | 12,364 | 12,892 | 1,493 | 239 | 377 |
| Hickory | 171 | 154 | -- | -- | -- | -- | -- | -- | -- | 152 | 350 | -- |
| Yellow birch | 182 | 1,161 | 385 | -- | 2,854 | 304 | 1,456 | 361 | 1,270 | 678 | 350 | 175 |
| Hard maple | -- | 18,654 | 1,464 | 530 | 38,195 | 3,949 | 43,409 | 41,325 | 6,870 | 6,226 | 211 | 19,964 |
| Soft maple | 26,163 | 21,552 | 29,020 | 11,909 | 19,439 | 21,004 | 2,814 | 49,949 | 24,836 | 12,095 | 29,714 | 32,510 |
| Beech | -- | 1,372 | 109 | 371 | 2,020 | 1,787 | 6,813 | 8,716 | 1,249 | 155 | 2,616 | 2,340 |
| Ash | 7,434 | 1,403 | 10,583 | 4,384 | 2,382 | 5,051 | 22,242 | 7,756 | 4,278 | 7,710 | 8,189 | 9,335 |
| Balsam poplar | 5,906 | 2,337 | 3,442 | 764 | -- | 348 | 70 | 133 | 351 | 217 | 830 | 990 |
| Cottonwood | 482 | -- | 1,492 | 610 | -- | -- | -- | -- | -- | -- | 1,206 | 198 |
| Bigtooth aspen | 34,365 | 16,506 | 16,219 | 14,798 | 9,912 | 20,258 | 1,889 | 6,838 | 16,447 | 23,621 | 29,781 | 21,801 |
| Quaking aspen | 42,665 | 19,628 | 16,769 | 9,651 | 11,615 | 14,644 | 501 | 15,009 | 12,760 | 10,346 | 19,140 | 18,444 |
| Basswood | 1,072 | 4,506 | 2,058 | 634 | 18,904 | 5,028 | 15,722 | 6,158 | 1,883 | 3,811 | 2,858 | 4,337 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 423 | 1,352 | 1,520 | 341 | 3,449 | 4,490 | 260 | 9,670 | 1,928 | 4,337 | 269 | 2,430 |
| Butternut | -- | -- | -- | 106 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,681 | 517 | 455 | 120 | 1,701 | 1,155 | 901 | 472 | 771 | 1,269 | 504 | 510 |
| Paper birch | 11,877 | 5,995 | 7,935 | 2,963 | 3,346 | 2,745 | 1,266 | 4,752 | 1,762 | 4,585 | 8,538 | 9,313 |
| Other hardwoods | 320 | -- | 2,915 | 182 | -- | 237 | -- | 466 | 264 | -- | 367 | 212 |
| Total | 150,199 | 115,246 | 122,771 | 60,910 | 129,502 | 205,947 | 100,658 | 201,540 | 124,350 | 86,697 | 125,943 | 149,495 |
| All species | 161,384 | 164,917 | 225,748 | 71,290 | 190,384 | 303,726 | 112,604 | 244,928 | 152,245 | 104,234 | 135,485 | 185,718 |

(Table 28 continued on next page)

(Table 28 continued)

| Species group | County<br>Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | |
| White pine | 3,395 | 13,239 | 4,403 | 1,190 | 3,331 | 8,264 | 15,615 | 3,122 | 10,819 | 5,188 |
| Red pine | 14,673 | 33,538 | 6,878 | 2,559 | -- | 31,212 | 16,139 | 11,670 | 21,190 | 57,173 |
| Jack pine | 19,221 | 9,427 | 1,840 | 18,738 | 632 | 45,739 | 9,488 | 10,838 | 19,502 | 13,068 |
| White spruce | 2,193 | -- | 248 | 1,061 | 321 | 883 | 1,095 | 3,270 | 464 | -- |
| Black spruce | 2,494 | 147 | 104 | 146 | 229 | 203 | 5,265 | 3,414 | 2,283 | 1,562 |
| Balsam fir | 4,807 | 211 | 150 | 3,393 | 2,529 | 4,276 | 5,001 | 16,023 | 5,811 | 1,298 |
| Hemlock | 1,228 | 3,803 | 4,343 | 393 | 8,252 | 15 | 1,570 | 1,923 | 294 | 2,818 |
| Tamarack | 2,201 | 894 | 174 | 3 | 431 | 70 | 352 | 1,830 | 998 | 374 |
| Northern white-cedar | 14,493 | 5,210 | 3,757 | 14,254 | 17,433 | 7,553 | 12,226 | 61,444 | 32,523 | 14,421 |
| Other softwoods | 1,175 | 2,402 | 1,289 | 8 | 162 | 141 | -- | 190 | -- | 3,269 |
| Total | 65,880 | 68,871 | 23,186 | 41,745 | 33,320 | 98,356 | 66,751 | 113,724 | 93,884 | 99,171 |
| HARDWOODS | | | | | | | | | | |
| Select white oaks | 2,834 | 39,693 | 13,903 | 3,006 | 1,292 | 7,688 | 589 | 638 | 17,176 | 5,066 |
| Select red oaks | 36,715 | 49,687 | 19,316 | 42,497 | 17,475 | 38,852 | 10,756 | 16,444 | 78,341 | 16,380 |
| Other red oaks | 266 | 39,995 | 9,192 | 1,670 | -- | 15,240 | 1,432 | -- | 704 | 5,444 |
| Hickory | -- | 633 | -- | -- | 181 | -- | -- | -- | -- | -- |
| Yellow birch | -- | 1,741 | 1,825 | 471 | 2,806 | 157 | 1,964 | 1,346 | 617 | 2,232 |
| Hard maple | 18,556 | 8,743 | 6,902 | 5,415 | 29,220 | 6,524 | 78,851 | 9,654 | 1,442 | 36,206 |
| Soft maple | 24,287 | 49,776 | 28,501 | 23,790 | 26,357 | 13,184 | 18,681 | 11,638 | 31,818 | 31,592 |
| Beech | 2,681 | 3,932 | 3,140 | 952 | 5,781 | 902 | 8,045 | 1,214 | 494 | 7,432 |
| Ash | 5,470 | 9,164 | 7,842 | 8,777 | 11,352 | 3,715 | 4,779 | 7,622 | 8,268 | 8,261 |
| Balsam poplar | 2,924 | 1,674 | 850 | 3,822 | 1,290 | 2,890 | 3,697 | 13,455 | 1,972 | 611 |
| Cottonwood | -- | 252 | 3,547 | -- | 375 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 16,296 | 19,658 | 9,505 | 43,513 | 19,093 | 20,234 | 17,492 | 16,299 | 29,820 | 16,800 |
| Quaking aspen | 24,094 | 14,200 | 7,758 | 25,509 | 25,153 | 27,353 | 18,030 | 35,165 | 26,591 | 14,339 |
| Basswood | 15,557 | 6,124 | 2,337 | 4,450 | 7,507 | 4,967 | 42,803 | 8,237 | 1,864 | 8,903 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | 200 |
| Black cherry | 934 | 7,905 | 5,033 | 1,825 | 7,494 | 1,593 | 2,262 | -- | 1,388 | 8,769 |
| Butternut | -- | 172 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 402 | 665 | 448 | 384 | 429 | -- | 3,210 | 821 | -- | 2,697 |
| Paper birch | 12,697 | 1,639 | 2,679 | 18,852 | 6,937 | 6,791 | 6,776 | 17,735 | 11,310 | 2,946 |
| Other hardwoods | -- | 2,412 | 1,277 | 173 | 174 | -- | -- | -- | -- | -- |
| Total | 163,713 | 258,065 | 124,055 | 185,106 | 162,916 | 150,090 | 219,367 | 140,268 | 211,805 | 167,878 |
| All species | 229,593 | 326,936 | 147,241 | 226,851 | 196,236 | 248,446 | 286,118 | 253,992 | 305,689 | 267,049 |

Table 29.--Net volume of sawtimber on commercial forest land by species group and county, Northern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 811,402 | 41,129 | 28,267 | 7,414 | 5,202 | -- | 1,255 | 25,044 | 44,688 | 25,564 | 20,658 | 6,476 |
| Red pine | 1,053,736 | 53,659 | 25,006 | 1,063 | 3,680 | -- | -- | 14,378 | 65,438 | 14,619 | 73,930 | 2,256 |
| Jack pine | 684,828 | 47,405 | 4,344 | -- | 8,825 | -- | -- | 2,276 | 20,651 | 27,530 | 100,801 | -- |
| White spruce | 121,852 | 8,602 | 26,095 | 721 | -- | -- | -- | 14,936 | 36,888 | -- | -- | 1,970 |
| Black spruce | 41,690 | 5,651 | -- | 5,101 | -- | -- | -- | 1,111 | 2,975 | -- | 2,536 | 4,240 |
| Balsam fir | 151,930 | 15,509 | 26,505 | 4,755 | -- | -- | -- | 3,803 | 17,187 | 1,453 | 1,298 | 8,127 |
| Hemlock | 252,871 | 5,165 | 1,953 | 20,178 | -- | -- | 15,694 | 8,540 | 13,349 | 844 | 5,038 | 14,947 |
| Tamarack | 56,260 | -- | 2,506 | 493 | 1,969 | -- | 3,167 | 833 | 4,069 | 4,833 | 1,467 | -- |
| Northern white-cedar | 653,206 | 30,900 | 57,222 | 26,988 | 691 | -- | 7,372 | 30,721 | 60,703 | 12,365 | 2,834 | 11,168 |
| Other softwoods | 11,647 | 668 | -- | 643 | 538 | -- | 660 | -- | -- | -- | 222 | -- |
| Total | 3,839,422 | 208,688 | 171,898 | 67,356 | 20,905 | -- | 28,148 | 101,642 | 265,948 | 87,208 | 208,784 | 49,184 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 572,193 | 22,896 | 3,605 | -- | 691 | 1,845 | -- | -- | 1,783 | 42,295 | 13,968 | -- |
| Select red oaks | 2,159,690 | 160,912 | 48,141 | -- | 22,745 | -- | 3,756 | 11,494 | 30,142 | 112,577 | 105,148 | 22,032 |
| Other red oaks | 488,102 | 21,109 | -- | -- | 6,541 | -- | -- | -- | 1,848 | 34,620 | 12,075 | -- |
| Hickory | 5,588 | -- | -- | -- | -- | -- | -- | -- | -- | 1,224 | -- | -- |
| Yellow birch | 77,578 | -- | -- | 1,385 | -- | -- | 5,960 | 11,662 | 4,337 | -- | -- | 3,975 |
| Hard maple | 1,188,575 | 11,070 | 3,921 | 88,241 | -- | -- | 94,680 | 97,973 | 48,252 | 7,863 | 7,858 | 101,823 |
| Soft maple | 1,450,072 | 55,391 | 45,207 | 36,428 | 28,175 | 10,030 | 44,233 | 19,884 | 24,600 | 49,525 | 4,482 | 16,063 |
| Beech | 389,470 | 5,761 | -- | 31,115 | 1,768 | -- | 33,182 | 30,002 | 21,656 | 5,516 | 6,515 | 51,227 |
| Ash | 487,434 | 12,039 | 8,407 | 18,203 | 29,659 | 16,578 | 15,373 | 28,384 | 13,395 | 7,143 | 882 | 28,014 |
| Balsam poplar | 353,766 | 61,784 | 35,989 | 3,536 | 3,209 | -- | -- | 9,081 | 22,722 | 5,207 | 2,061 | 20,818 |
| Cottonwood | 42,830 | -- | -- | -- | 4,362 | 4,039 | -- | -- | -- | 2,085 | -- | -- |
| Bigtooth aspen | 1,339,410 | 48,001 | 91,389 | 51,630 | 36,335 | 11,280 | 17,036 | 30,652 | 61,771 | 61,966 | 22,958 | 94,267 |
| Quaking aspen | 1,366,066 | 74,630 | 63,795 | 19,062 | 34,578 | 3,006 | 12,951 | 56,993 | 129,876 | 42,130 | 8,361 | 79,461 |
| Basswood | 834,836 | 30,957 | 4,960 | 49,294 | 2,749 | -- | 45,724 | 65,258 | 84,727 | 2,140 | 18,236 | 44,703 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 172,403 | 4,696 | -- | 3,409 | -- | -- | 20,820 | -- | -- | 3,660 | -- | 16,028 |
| Butternut | 1,427 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 44,130 | -- | -- | 4,483 | -- | -- | 717 | 3,967 | 1,150 | -- | -- | -- |
| Paper birch | 233,758 | 8,117 | 14,795 | 3,555 | 5,112 | -- | 6,237 | 41,504 | 18,981 | 5,440 | 1,829 | 12,656 |
| Other hardwoods | 35,432 | 1,531 | -- | -- | 3,169 | -- | -- | -- | 878 | 1,068 | -- | -- |
| Total | 11,242,760 | 518,894 | 320,209 | 310,341 | 179,093 | 46,778 | 300,669 | 406,854 | 466,118 | 384,459 | 204,373 | 491,067 |
| All species | 15,082,182 | 727,582 | 492,107 | 377,697 | 199,998 | 46,778 | 328,817 | 508,496 | 732,066 | 471,667 | 413,157 | 540,251 |

(Table 29 continued on next page)

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[1] International 1/4-inch rule.

(Table 29 continued)

| Species group | County<br>Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 20,468 | 22,543 | 28,773 | 1,652 | 22,362 | 63,814 | 12,647 | 28,066 | 12,911 | 18,070 | 26,887 | 37,606 |
| Red pine | 10,630 | 32,216 | 90,685 | 695 | 59,707 | 65,377 | -- | 25,495 | 15,165 | 9,288 | 8,749 | 8,294 |
| Jack pine | 7,623 | 17,805 | 51,272 | -- | 30,174 | 31,919 | -- | 4,737 | 8,907 | 1,111 | -- | 9,550 |
| White spruce | -- | -- | 7,347 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | 1,120 | -- | -- | -- | -- | -- | -- | 2,619 |
| Balsam fir | 2,287 | -- | 7,585 | -- | 8,628 | -- | -- | -- | -- | -- | -- | 3,887 |
| Hemlock | 1,074 | 9,902 | 11,041 | 7,377 | 6,400 | 5,238 | 7,079 | 3,055 | 5,086 | 11,816 | 5,598 | 399 |
| Tamarack | -- | 7,171 | 8,864 | 1,815 | -- | 46 | 1,184 | 5,162 | 27 | 1 | -- | 4,582 |
| Northern white-cedar | 2,029 | 15,929 | 31,517 | 3,784 | 14,438 | 10,070 | 5,051 | 10,023 | 8,681 | 6,551 | -- | 24,512 |
| Other softwoods | -- | -- | 202 | 1,242 | -- | 777 | -- | -- | 2,992 | -- | -- | 719 |
| Total | 44,111 | 105,566 | 237,286 | 16,565 | 142,829 | 177,241 | 25,961 | 76,538 | 53,769 | 46,837 | 41,234 | 92,168 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 7,472 | 21,278 | 5,977 | 16,354 | 2,685 | 93,539 | -- | 40,439 | 42,198 | 18,554 | 28,672 | 12,266 |
| Select red oaks | 29,582 | 42,368 | 24,342 | 38,637 | 41,312 | 186,086 | 15,594 | 78,062 | 73,218 | 22,488 | 43,854 | 89,577 |
| Other red oaks | 4,176 | 1,024 | 17,466 | 4,434 | -- | 75,314 | -- | 36,640 | 36,458 | 6,001 | 1,403 | 2,011 |
| Hickory | 950 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,314 | -- |
| Yellow birch | 949 | 1,661 | 1,161 | -- | 3,978 | 106 | 6,028 | 1 | 3,176 | -- | 893 | 1,040 |
| Hard maple | -- | 48,298 | 4,944 | 1,993 | 52,453 | 6,484 | 94,814 | 133,061 | 21,550 | 26,285 | -- | 28,855 |
| Soft maple | 23,532 | 49,256 | 61,470 | 33,275 | 23,615 | 26,172 | 12,742 | 156,115 | 74,479 | 24,648 | 81,598 | 59,171 |
| Beech | -- | 7,757 | 36 | 1,125 | 7,900 | 3,793 | 33,056 | 33,721 | 2,720 | 27 | 4,688 | 4,949 |
| Ash | 8,069 | 686 | 11,991 | 6,320 | 1,710 | 10,352 | 78,928 | 20,527 | 8,480 | 14,141 | 14,708 | 18,361 |
| Balsam poplar | 22,014 | 12,105 | 15,704 | 1,878 | -- | 1,879 | -- | 659 | 1,982 | 1,097 | 4,452 | 4,056 |
| Cottonwood | 1,591 | -- | 8,047 | 3,270 | -- | -- | -- | -- | -- | -- | 6,249 | 1,052 |
| Bigtooth aspen | 93,490 | 34,233 | 29,560 | 21,089 | 18,112 | 31,732 | 5,057 | 12,426 | 16,483 | 61,662 | 41,068 | 33,059 |
| Quaking aspen | 86,778 | 52,686 | 41,553 | 14,486 | 19,787 | 32,771 | 2,111 | 28,140 | 22,118 | 14,996 | 31,838 | 32,974 |
| Basswood | 2,943 | 17,748 | 8,024 | 2,228 | 41,076 | 17,941 | 54,930 | 22,573 | 8,975 | 10,414 | 11,665 | 15,065 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 1,860 | -- | 1,025 | 5,335 | 9,621 | -- | 25,339 | 2,977 | 28 | -- | 1,517 |
| Butternut | -- | -- | -- | 453 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 889 | 2,403 | 1,089 | -- | 1,934 | 2,120 | 1,061 | 1,559 | 1,950 | 2,002 | -- | 794 |
| Paper birch | 1,913 | 3,759 | 6,041 | -- | 5,647 | 2,819 | 4,417 | 12,416 | 531 | 6,460 | 2,872 | 10,812 |
| Other hardwoods | 1,526 | -- | 13,806 | 890 | -- | -- | -- | -- | -- | -- | 883 | 1,089 |
| Total | 285,874 | 297,122 | 251,211 | 147,457 | 225,544 | 500,729 | 308,738 | 601,678 | 317,295 | 208,803 | 276,157 | 316,648 |
| All species | 329,985 | 402,688 | 488,497 | 164,022 | 368,373 | 677,970 | 334,699 | 678,216 | 371,064 | 255,640 | 317,391 | 408,816 |

(Table 29 continued on next page)

(Table 29 continued)

| | County | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species group | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| SOFTWOODS | | | | | | | | | | |
| White pine | 15,541 | 61,561 | 17,129 | 2,618 | 12,389 | 40,765 | 69,609 | 16,055 | 54,771 | 19,468 |
| Red pine | 44,952 | 45,589 | 9,402 | 12,379 | -- | 92,177 | 47,832 | 45,729 | 92,722 | 82,624 |
| Jack pine | 51,010 | 12,172 | 3,130 | 32,201 | 2,465 | 109,352 | 22,597 | 16,111 | 48,423 | 12,437 |
| White spruce | 6,885 | -- | -- | 3,411 | -- | 1,657 | 3,132 | 10,208 | -- | -- |
| Black spruce | 2,469 | -- | -- | -- | 997 | 780 | 5,198 | 6,117 | 776 | -- |
| Balsam fir | 7,058 | -- | -- | 2,161 | 2,777 | 6,532 | 6,714 | 19,238 | 5,359 | 1,067 |
| Hemlock | 5,217 | 10,508 | 13,789 | 1,185 | 36,241 | 79 | 8,368 | 8,017 | 434 | 9,260 |
| Tamarack | -- | 3,220 | 46 | -- | 1,060 | -- | 2,010 | 132 | 1,533 | 70 |
| Northern white-cedar | 14,613 | 9,388 | 4,040 | 17,659 | 34,045 | 14,690 | 18,541 | 99,105 | 51,881 | 15,695 |
| Other softwoods | 727 | 1,549 | -- | 38 | -- | 670 | -- | -- | -- | -- |
| Total | 148,472 | 143,987 | 47,536 | 71,652 | 89,974 | 266,702 | 184,001 | 220,712 | 255,899 | 140,621 |
| HARDWOODS | | | | | | | | | | |
| Select white oaks | 3,613 | 85,386 | 44,288 | 1,819 | 2,618 | 10,657 | -- | 1,653 | 32,579 | 13,063 |
| Select red oaks | 99,204 | 183,569 | 71,628 | 81,192 | 60,799 | 123,785 | 38,683 | 37,206 | 186,523 | 75,034 |
| Other red oaks | -- | 143,570 | 31,287 | 5,251 | -- | 20,785 | 3,162 | -- | 1,414 | 21,513 |
| Hickory | -- | 963 | -- | -- | 1,137 | -- | -- | -- | -- | -- |
| Yellow birch | -- | 5,378 | 3,858 | -- | 5,491 | -- | 2,917 | 5,270 | 1,009 | 7,343 |
| Hard maple | 20,445 | 21,731 | 15,787 | 3,256 | 79,125 | 6,518 | 89,465 | 12,363 | -- | 59,467 |
| Soft maple | 21,866 | 139,175 | 76,242 | 38,680 | 56,062 | 16,373 | 23,082 | 13,502 | 43,345 | 61,654 |
| Beech | 4,598 | 12,353 | 10,981 | 2,463 | 30,039 | 48 | 25,515 | 998 | -- | 15,961 |
| Ash | 8,488 | 21,194 | 17,706 | 8,727 | 19,453 | 7,694 | 11,240 | 1,007 | 9,775 | 9,800 |
| Balsam poplar | 11,404 | 9,091 | 774 | 15,527 | 4,926 | 14,124 | 12,792 | 44,526 | 7,329 | 3,040 |
| Cottonwood | -- | 1,289 | 8,658 | -- | 2,188 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 34,756 | 31,220 | 13,498 | 79,464 | 57,321 | 37,465 | 46,556 | 30,833 | 57,657 | 25,384 |
| Quaking aspen | 55,483 | 22,731 | 16,054 | 62,153 | 90,348 | 41,249 | 20,506 | 58,359 | 67,189 | 26,913 |
| Basswood | 38,152 | 19,363 | 6,280 | 19,146 | 34,367 | 7,862 | 91,572 | 20,890 | 8,933 | 25,941 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,535 | 16,803 | 15,563 | -- | 22,309 | 2,044 | 1,215 | -- | -- | 16,619 |
| Butternut | -- | 974 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,729 | 1,515 | 557 | 786 | -- | -- | 7,342 | -- | -- | 6,083 |
| Paper birch | 6,973 | 1,066 | 2,610 | 11,535 | 5,946 | 8,561 | 6,028 | 3,825 | 8,674 | 2,627 |
| Other hardwoods | -- | 8,524 | 1,214 | 854 | -- | -- | -- | -- | -- | -- |
| Total | 308,246 | 725,895 | 336,985 | 330,853 | 472,129 | 297,165 | 380,075 | 230,432 | 424,427 | 370,442 |
| All species | 456,718 | 869,882 | 384,521 | 402,505 | 562,103 | 563,867 | 564,076 | 451,144 | 680,326 | 511,063 |

Table 30.--Net volume of growing stock on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 176,763 | 10,453 | 14,519 | 14,794 | 17,203 | 20,404 | 22,136 | 22,028 | 17,044 | 10,484 | 23,103 | 4,120 | 475 |
| Red pine | 452,495 | 138,132 | 117,226 | 66,798 | 42,867 | 24,964 | 23,897 | 20,302 | 9,628 | 6,608 | 2,073 | -- | -- |
| Jack pine | 335,918 | 90,320 | 116,503 | 83,539 | 29,617 | 11,863 | 3,186 | 725 | 165 | -- | -- | -- | -- |
| White spruce | 38,705 | 7,301 | 6,958 | 8,842 | 6,020 | 4,277 | 2,389 | 1,266 | 775 | 699 | 178 | -- | -- |
| Black spruce | 35,972 | 13,101 | 13,877 | 6,664 | 1,409 | 659 | 262 | -- | -- | -- | -- | -- | -- |
| Balsam fir | 115,899 | 42,614 | 38,623 | 22,061 | 8,510 | 2,621 | 1,470 | -- | -- | -- | -- | -- | -- |
| Hemlock | 64,960 | 7,483 | 9,914 | 7,844 | 8,340 | 9,645 | 5,670 | 6,376 | 3,900 | 2,001 | 3,787 | -- | -- |
| Tamarack | 26,795 | 9,553 | 6,412 | 5,114 | 3,618 | 1,272 | 570 | -- | -- | 256 | -- | -- | -- |
| Northern white-cedar | 431,116 | 155,248 | 134,585 | 77,176 | 34,843 | 19,137 | 6,712 | 1,939 | 1,131 | 345 | -- | -- | -- |
| Other softwoods | 28,428 | 17,143 | 8,950 | 1,837 | -- | 379 | -- | -- | 119 | -- | -- | -- | -- |
| Total | 1,707,051 | 491,348 | 467,567 | 294,669 | 152,427 | 95,221 | 66,292 | 52,636 | 32,762 | 20,393 | 29,141 | 4,120 | 475 |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 251,160 | 41,083 | 55,702 | 49,400 | 41,999 | 21,498 | 17,060 | 10,746 | 7,010 | 3,626 | 2,418 | 618 | -- |
| Select red oaks | 721,458 | 60,607 | 116,100 | 142,530 | 122,570 | 89,945 | 70,262 | 53,276 | 27,611 | 16,472 | 17,196 | 4,302 | 587 |
| Other red oaks | 180,189 | 20,382 | 31,840 | 37,147 | 29,496 | 20,270 | 14,327 | 14,697 | 4,355 | 3,169 | 3,793 | 713 | -- |
| Hickory | 1,838 | -- | 437 | 465 | 558 | 181 | -- | 197 | -- | -- | -- | -- | -- |
| Yellow birch | 37,604 | 7,259 | 7,479 | 8,487 | 6,181 | 2,999 | 2,754 | 1,546 | 336 | 351 | 212 | -- | -- |
| Hard maple | 692,984 | 168,489 | 163,941 | 135,865 | 87,024 | 58,040 | 36,103 | 18,554 | 10,665 | 5,635 | 7,468 | 1,014 | 186 |
| Soft maple | 748,355 | 153,028 | 171,758 | 147,951 | 105,780 | 66,589 | 40,485 | 26,590 | 17,877 | 6,257 | 9,132 | 1,571 | 1,337 |
| Beech | 121,689 | 16,507 | 16,053 | 16,658 | 11,720 | 16,564 | 13,846 | 12,671 | 8,556 | 5,173 | 3,304 | 637 | -- |
| Ash | 251,892 | 56,407 | 53,025 | 51,157 | 37,500 | 25,651 | 14,793 | 7,556 | 2,485 | 1,210 | 1,411 | 697 | -- |
| Balsam poplar | 98,083 | 7,904 | 13,829 | 13,686 | 14,962 | 15,949 | 13,626 | 8,376 | 5,404 | 2,955 | 793 | 599 | -- |
| Cottonwood | 10,261 | 389 | 952 | 1,224 | 1,373 | 1,145 | 956 | 357 | 1,416 | 462 | 721 | -- | 1,266 |
| Bigtooth aspen | 653,639 | 79,938 | 142,775 | 175,906 | 135,683 | 68,622 | 28,948 | 14,398 | 4,432 | 1,436 | 1,501 | -- | -- |
| Quaking aspen | 630,943 | 89,431 | 136,923 | 151,815 | 122,263 | 69,949 | 39,124 | 14,306 | 5,864 | 1,061 | 207 | -- | -- |
| Basswood | 325,173 | 34,317 | 59,618 | 83,628 | 60,191 | 42,404 | 22,860 | 12,969 | 4,628 | 2,180 | 1,769 | 609 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 200 | -- | -- | 200 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 94,087 | 14,777 | 23,749 | 21,470 | 12,377 | 12,360 | 5,156 | 1,770 | 1,377 | 927 | 124 | -- | -- |
| Butternut | 278 | -- | -- | -- | -- | 278 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 30,117 | 8,004 | 7,968 | 5,850 | 4,748 | 995 | 1,559 | 833 | 160 | -- | -- | -- | -- |
| Paper birch | 256,960 | 67,959 | 82,945 | 59,593 | 27,535 | 11,107 | 6,292 | 1,234 | 295 | -- | -- | -- | -- |
| Other hardwoods | 10,705 | 1,288 | 691 | 1,811 | 1,456 | 1,399 | 947 | 757 | 1,045 | 610 | 701 | -- | -- |
| Total | 5,117,615 | 827,769 | 1,085,785 | 1,104,843 | 823,416 | 525,945 | 329,098 | 200,833 | 103,516 | 51,524 | 50,750 | 10,760 | 3,376 |
| All species | 6,824,666 | 1,319,117 | 1,553,352 | 1,399,512 | 975,843 | 621,166 | 395,390 | 253,469 | 136,278 | 71,917 | 79,891 | 14,880 | 3,851 |

Table 31.--Net volume of sawtimber on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 811,402 | 71,567 | 85,977 | 104,604 | 116,391 | 118,667 | 93,937 | 58,860 | 133,519 | 24,830 | 3,050 |
| Red pine | 1,053,736 | 334,138 | 235,870 | 141,930 | 134,491 | 112,248 | 51,469 | 33,685 | 9,905 | -- | -- |
| Jack pine | 684,828 | 438,451 | 162,057 | 63,635 | 16,540 | 3,394 | 751 | -- | -- | -- | -- |
| White spruce | 121,852 | 42,579 | 29,163 | 21,184 | 12,537 | 6,870 | 4,339 | 4,096 | 1,084 | -- | -- |
| Black spruce | 41,690 | 29,174 | 7,078 | 3,589 | 1,849 | -- | -- | -- | -- | -- | -- |
| Balsam fir | 151,930 | 91,541 | 39,883 | 12,912 | 7,594 | -- | -- | -- | -- | -- | -- |
| Hemlock | 252,871 | 34,416 | 41,071 | 50,923 | 32,324 | 36,327 | 23,335 | 11,800 | 22,675 | -- | -- |
| Tamarack | 56,260 | 24,450 | 18,764 | 6,868 | 4,254 | -- | -- | 1,924 | -- | -- | -- |
| Northern white-cedar | 653,206 | 352,951 | 161,604 | 89,348 | 32,531 | 9,070 | 5,953 | 1,749 | -- | -- | -- |
| Other softwoods | 11,647 | 9,309 | -- | 1,800 | -- | -- | 538 | -- | -- | -- | -- |
| Total | 3,839,422 | 1,428,576 | 781,467 | 496,793 | 358,511 | 286,576 | 180,322 | 112,114 | 167,183 | 24,830 | 3,050 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 572,193 | -- | 220,244 | 117,414 | 95,532 | 61,914 | 40,776 | 19,772 | 13,185 | 3,356 | -- |
| Select red oaks | 2,159,690 | -- | 600,492 | 476,204 | 392,774 | 306,342 | 161,766 | 96,851 | 99,193 | 23,257 | 2,811 |
| Other red oaks | 488,102 | -- | 143,574 | 108,126 | 80,335 | 85,526 | 25,525 | 18,878 | 22,097 | 4,041 | -- |
| Hickory | 5,588 | -- | 3,227 | 1,137 | -- | 1,224 | -- | -- | -- | -- | -- |
| Yellow birch | 77,578 | -- | 32,856 | 17,005 | 14,426 | 8,468 | 1,877 | 1,976 | 970 | -- | -- |
| Hard maple | 1,188,575 | -- | 437,852 | 314,120 | 198,270 | 103,791 | 59,082 | 30,604 | 38,890 | 5,136 | 830 |
| Soft maple | 1,450,072 | -- | 556,724 | 352,487 | 213,700 | 139,777 | 94,110 | 31,525 | 46,500 | 8,228 | 7,021 |
| Beech | 389,470 | -- | 56,915 | 90,529 | 79,415 | 71,797 | 47,771 | 26,356 | 14,474 | 2,213 | -- |
| Ash | 487,434 | -- | 191,058 | 137,431 | 82,251 | 43,927 | 14,209 | 6,932 | 8,130 | 3,496 | -- |
| Balsam poplar | 353,766 | -- | 97,126 | 92,359 | 72,777 | 43,270 | 26,330 | 15,319 | 3,889 | 2,696 | -- |
| Cottonwood | 42,830 | -- | 7,774 | 6,386 | 5,327 | 2,069 | 7,975 | 2,407 | 4,087 | -- | 6,805 |
| Bigtooth aspen | 1,339,410 | -- | 679,717 | 373,074 | 163,149 | 83,321 | 24,717 | 8,025 | 7,407 | -- | -- |
| Quaking aspen | 1,366,066 | -- | 625,697 | 389,928 | 226,068 | 83,572 | 33,978 | 5,720 | 1,103 | -- | -- |
| Basswood | 834,836 | -- | 332,136 | 241,910 | 132,519 | 74,761 | 27,347 | 13,437 | 10,048 | 2,678 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 172,403 | -- | 59,353 | 67,988 | 27,184 | 8,415 | 5,685 | 3,419 | 359 | -- | -- |
| Butternut | 1,427 | -- | -- | 1,427 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 44,130 | -- | 24,050 | 5,742 | 8,809 | 4,532 | 997 | -- | -- | -- | -- |
| Paper birch | 233,758 | -- | 137,443 | 55,984 | 31,551 | 7,092 | 1,688 | -- | -- | -- | -- |
| Other hardwoods | 35,432 | -- | 7,239 | 7,365 | 4,605 | 3,773 | 5,407 | 3,311 | 3,732 | -- | -- |
| Total | 11,242,760 | -- | 4,213,477 | 2,856,616 | 1,828,692 | 1,133,571 | 579,240 | 284,532 | 274,064 | 55,101 | 17,467 |
| All species | 15,082,182 | 1,428,576 | 4,994,944 | 3,353,409 | 2,187,203 | 1,420,147 | 759,562 | 396,646 | 441,247 | 79,931 | 20,517 |

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[1] International 1/4-inch rule.

Table 32.--Net volume of growing stock on commercial forest land by species group and forest type, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 176,763 | 5,461 | 14,598 | 50,226 | 2,745 | 221 | 1,325 | 13,227 |
| Red pine | 452,495 | 32,916 | 323,456 | 10,502 | 538 | -- | -- | 1,435 |
| Jack pine | 335,918 | 237,410 | 37,194 | 2,304 | -- | -- | -- | -- |
| White spruce | 38,705 | -- | 1,368 | 1,731 | 3,744 | 6,799 | 239 | 14,305 |
| Black spruce | 35,972 | 737 | 484 | 1,109 | 1,478 | 132 | 6,554 | 21,520 |
| Balsam fir | 115,899 | 147 | 743 | 1,806 | 16,572 | 3,247 | 972 | 37,565 |
| Hemlock | 64,960 | -- | 1,337 | -- | -- | -- | -- | 6,275 |
| Tamarack | 26,795 | 108 | -- | -- | 276 | -- | 183 | 15,061 |
| Northern white-cedar | 431,116 | -- | 721 | 1,035 | 4,375 | 3,391 | 3,264 | 285,596 |
| Other softwoods | 28,428 | -- | 2,094 | 3,780 | -- | -- | -- | 1,029 |
| Total | 1,707,051 | 276,779 | 381,995 | 72,493 | 29,728 | 13,790 | 12,537 | 396,013 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 251,160 | 2,782 | 7,331 | 3,899 | -- | -- | -- | -- |
| Select red oaks | 721,458 | 27,976 | 13,359 | 4,612 | -- | -- | -- | -- |
| Other red oaks | 180,189 | 12,982 | 10,949 | -- | -- | -- | -- | -- |
| Hickory | 1,838 | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 37,604 | -- | -- | 377 | -- | -- | -- | 2,343 |
| Hard maple | 692,984 | 145 | 1,066 | -- | 160 | -- | -- | 533 |
| Soft maple | 748,355 | 3,105 | 6,982 | 2,329 | 2,772 | 199 | 90 | 18,806 |
| Beech | 121,689 | -- | 515 | -- | -- | -- | -- | -- |
| Ash | 251,892 | -- | 278 | -- | 472 | -- | -- | 13,832 |
| Balsam poplar | 98,083 | -- | -- | -- | 616 | 1,623 | 561 | 14,930 |
| Cottonwood | 10,261 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 653,639 | 1,796 | 6,384 | 2,709 | 200 | 215 | -- | 4,276 |
| Quaking aspen | 630,943 | 8,304 | 7,752 | 3,987 | 8,080 | 740 | 778 | 13,491 |
| Basswood | 325,173 | 464 | 712 | -- | -- | -- | -- | 1,424 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 200 | -- | 200 | -- | -- | -- | -- | -- |
| Black cherry | 94,087 | 260 | 1,552 | 301 | 284 | -- | 79 | 357 |
| Butternut | 278 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 30,117 | 144 | -- | 95 | -- | -- | -- | 899 |
| Paper birch | 256,960 | 282 | 804 | 1,347 | 6,935 | 77 | 501 | 30,865 |
| Other hardwoods | 10,705 | -- | -- | -- | -- | -- | -- | 336 |
| Total | 5,117,615 | 58,240 | 57,884 | 19,656 | 19,519 | 2,854 | 2,009 | 102,092 |
| All species | 6,824,666 | 335,019 | 439,879 | 92,149 | 49,247 | 16,644 | 14,546 | 498,105 |

(Table 32 continued on next page)

(Table 32 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 610 | 14,664 | 9,965 | 34,490 | 27,642 | 1,510 | 79 | -- |
| Red pine | -- | 25,314 | 1,990 | 17,237 | 33,171 | 1,681 | 4,074 | 181 |
| Jack pine | 570 | 39,803 | -- | 7,431 | 10,527 | -- | 505 | 174 |
| White spruce | -- | -- | 1,193 | 785 | 7,934 | 607 | -- | -- |
| Black spruce | 1,155 | 156 | 1,198 | 62 | 1,243 | 144 | -- | -- |
| Balsam fir | 396 | 1,651 | 7,075 | 4,572 | 37,363 | 3,650 | -- | 140 |
| Hemlock | -- | 583 | 3,766 | 46,973 | 4,512 | 1,514 | -- | -- |
| Tamarack | 6,315 | -- | 1,683 | 1,552 | 896 | 721 | -- | -- |
| Northern white-cedar | 1,572 | 402 | 32,271 | 25,851 | 62,779 | 9,750 | 109 | -- |
| Other softwoods | -- | 379 | -- | 1,755 | 256 | -- | 19,135 | -- |
| Total | 10,618 | 82,952 | 59,141 | 140,708 | 186,323 | 19,577 | 23,902 | 495 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 200,397 | 4,247 | 15,465 | 16,370 | 669 | -- | -- |
| Select red oaks | -- | 469,108 | 3,172 | 95,874 | 103,439 | 3,125 | 635 | 158 |
| Other red oaks | -- | 145,015 | 545 | 4,859 | 5,839 | -- | -- | -- |
| Hickory | -- | -- | -- | 1,667 | -- | 171 | -- | -- |
| Yellow birch | -- | 418 | 5,976 | 25,548 | 1,500 | 1,316 | 126 | -- |
| Hard maple | -- | 3,682 | 4,508 | 658,610 | 21,037 | 2,800 | 443 | -- |
| Soft maple | 88 | 69,010 | 165,707 | 302,865 | 162,842 | 12,750 | 415 | 395 |
| Beech | -- | 1,535 | 494 | 112,461 | 6,133 | 551 | -- | -- |
| Ash | 248 | 5,856 | 69,503 | 132,750 | 23,438 | 5,148 | 92 | 275 |
| Balsam poplar | 302 | 273 | 9,132 | 3,617 | 64,812 | 1,802 | 415 | -- |
| Cottonwood | -- | -- | 5,986 | 1,814 | 2,461 | -- | -- | -- |
| Bigtooth aspen | -- | 88,144 | 5,552 | 103,706 | 436,344 | 4,313 | -- | -- |
| Quaking aspen | 176 | 15,250 | 28,237 | 94,734 | 437,473 | 11,352 | 589 | -- |
| Basswood | -- | 2,502 | 10,572 | 291,107 | 14,555 | 3,400 | 437 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 5,966 | 3,219 | 66,895 | 14,210 | 158 | 494 | 312 |
| Butternut | -- | 106 | -- | 172 | -- | -- | -- | -- |
| Elm | -- | 139 | 5,546 | 20,072 | 2,603 | 506 | 113 | -- |
| Paper birch | 551 | 11,153 | 18,110 | 53,155 | 81,625 | 51,555 | -- | -- |
| Other hardwoods | -- | 1,542 | 3,788 | 2,764 | 2,101 | 174 | -- | -- |
| Total | 1,365 | 1,020,096 | 344,294 | 1,988,135 | 1,396,782 | 99,790 | 3,759 | 1,140 |
| All species | 11,983 | 1,103,048 | 403,435 | 2,128,843 | 1,583,105 | 119,367 | 27,661 | 1,635 |

## Table 33.--Net volume of sawtimber on commercial forest land by species group and forest type, Northern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| | | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All types | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 811,402 | 24,591 | 56,156 | 252,395 | 13,250 | 1,160 | 7,009 | 68,328 |
| Red pine | 1,053,736 | 116,536 | 577,495 | 53,608 | 2,060 | -- | -- | 7,673 |
| Jack pine | 684,828 | 459,690 | 68,568 | 8,867 | -- | -- | -- | -- |
| White spruce | 121,852 | -- | 3,508 | 5,353 | 12,766 | 17,275 | 549 | 47,795 |
| Black spruce | 41,690 | 1,120 | -- | 2,278 | 2,641 | -- | 3,707 | 24,931 |
| Balsam fir | 151,930 | -- | -- | 3,914 | 24,628 | 5,059 | 923 | 44,309 |
| Hemlock | 252,871 | -- | 3,740 | -- | -- | -- | -- | 28,462 |
| Tamarack | 56,260 | -- | -- | -- | -- | -- | 796 | 23,216 |
| Northern white-cedar | 653,206 | -- | 633 | 1,401 | 11,157 | 5,669 | 4,398 | 410,678 |
| Other softwoods | 11,647 | -- | 1,243 | 777 | -- | -- | -- | -- |
| Total | 3,839,422 | 601,937 | 711,343 | 328,593 | 66,502 | 29,163 | 17,382 | 655,392 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 572,193 | 7,720 | 23,913 | 19,367 | -- | -- | -- | -- |
| Select red oaks | 2,159,690 | 67,098 | 54,405 | 13,333 | -- | -- | -- | -- |
| Other red oaks | 488,102 | 29,398 | 32,580 | -- | -- | -- | -- | -- |
| Hickory | 5,588 | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 77,578 | -- | -- | 1,076 | -- | -- | -- | 5,971 |
| Hard maple | 1,188,575 | -- | 1,786 | -- | -- | -- | -- | 645 |
| Soft maple | 1,450,072 | 3,609 | 11,664 | 1,730 | 9,670 | -- | -- | 38,220 |
| Beech | 389,470 | -- | 2,855 | -- | -- | -- | -- | -- |
| Ash | 487,434 | -- | 686 | -- | -- | -- | -- | 4,757 |
| Balsam poplar | 353,766 | -- | -- | -- | 1,148 | 8,302 | -- | 50,519 |
| Cottonwood | 42,830 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,339,410 | 2,460 | 7,453 | 5,456 | 1,151 | 1,235 | -- | 15,977 |
| Quaking aspen | 1,366,066 | 4,399 | 838 | 2,766 | 21,554 | -- | 1,359 | 50,351 |
| Basswood | 834,836 | 1,212 | 2,317 | -- | -- | -- | -- | 4,880 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 172,403 | -- | 1,633 | -- | -- | -- | -- | -- |
| Butternut | 1,427 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 44,130 | -- | -- | -- | -- | -- | -- | 1,834 |
| Paper birch | 233,758 | -- | 1,672 | 1,708 | 8,062 | -- | 957 | 22,733 |
| Other hardwoods | 35,432 | -- | -- | -- | -- | -- | -- | 878 |
| Total | 11,242,760 | 115,896 | 141,802 | 45,436 | 41,585 | 9,537 | 2,316 | 196,765 |
| All species | 15,082,182 | 717,833 | 853,145 | 374,029 | 108,087 | 38,700 | 19,698 | 852,157 |

(Table 33 continued on next page)

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[1] International 1/4-inch rule.

(Table 33 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 2,292 | 59,109 | 51,672 | 142,963 | 126,351 | 5,618 | 508 | -- |
| Red pine | -- | 75,714 | 9,742 | 56,902 | 146,029 | 6,969 | -- | 1,008 |
| Jack pine | 2,506 | 91,674 | -- | 20,447 | 30,042 | -- | 2,408 | 626 |
| White spruce | -- | -- | 5,525 | 2,854 | 25,443 | 784 | -- | -- |
| Black spruce | 3,974 | -- | 675 | -- | 2,364 | -- | -- | -- |
| Balsam fir | -- | 2,132 | 8,239 | 4,193 | 56,222 | 2,311 | -- | -- |
| Hemlock | -- | 1,677 | 9,144 | 192,307 | 14,088 | 3,453 | -- | -- |
| Tamarack | 12,424 | -- | 4,827 | 8,095 | 4,933 | 1,969 | -- | -- |
| Northern white-cedar | 2,837 | 1,324 | 51,853 | 55,539 | 97,450 | 10,267 | -- | -- |
| Other softwoods | -- | 1,800 | -- | 2,193 | 538 | -- | 5,096 | -- |
| Total | 24,033 | 233,430 | 141,677 | 485,493 | 503,460 | 31,371 | 8,012 | 1,634 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 403,444 | 13,804 | 52,410 | 48,559 | 2,976 | -- | -- |
| Select red oaks | -- | 1,301,499 | 9,093 | 387,305 | 313,808 | 11,263 | 972 | 914 |
| Other red oaks | -- | 386,367 | 1,463 | 20,810 | 17,484 | -- | -- | -- |
| Hickory | -- | -- | -- | 4,638 | -- | 950 | -- | -- |
| Yellow birch | -- | 949 | 11,889 | 54,197 | 1,854 | 883 | 759 | -- |
| Hard maple | -- | 4,224 | 9,530 | 1,144,503 | 22,515 | 3,905 | 1,467 | -- |
| Soft maple | -- | 69,511 | 531,425 | 571,923 | 191,217 | 17,948 | 1,556 | 1,599 |
| Beech | -- | 2,394 | 1,854 | 376,731 | 5,198 | 438 | -- | -- |
| Ash | -- | 10,449 | 108,118 | 341,054 | 19,989 | 1,905 | 476 | -- |
| Balsam poplar | 1,763 | 1,150 | 38,736 | 15,759 | 229,634 | 6,755 | -- | -- |
| Cottonwood | -- | -- | 23,028 | 8,097 | 11,705 | -- | -- | -- |
| Bigtooth aspen | -- | 143,483 | 12,056 | 263,638 | 874,115 | 12,386 | -- | -- |
| Quaking aspen | -- | 15,859 | 76,398 | 234,521 | 939,463 | 18,558 | -- | -- |
| Basswood | -- | 1,996 | 32,672 | 748,808 | 31,015 | 11,936 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 9,829 | 6,426 | 130,023 | 22,735 | -- | 1,757 | -- |
| Butternut | -- | 453 | -- | 974 | -- | -- | -- | -- |
| Elm | -- | -- | 6,739 | 33,252 | 2,305 | -- | -- | -- |
| Paper birch | 773 | 12,733 | 25,454 | 72,416 | 59,145 | 28,105 | -- | -- |
| Other hardwoods | -- | 4,913 | 15,469 | 9,932 | 3,357 | 883 | -- | -- |
| Total | 2,536 | 2,369,253 | 924,154 | 4,470,991 | 2,794,098 | 118,891 | 6,987 | 2,513 |
| All species | 26,569 | 2,602,683 | 1,065,831 | 4,956,484 | 3,297,558 | 150,262 | 14,999 | 4,147 |

Table 34.--Net volume of growing stock on commercial forest land by species group and ownership class; Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| | | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All owners | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 176,763 | 8,964 | -- | -- | -- | 55,688 | 935 | 1,584 | 24,202 | 30,097 | 55,293 |
| Red pine | 452,495 | 189,513 | -- | 101 | -- | 128,590 | 1,860 | 4,200 | 44,723 | 20,878 | 62,630 |
| Jack pine | 335,918 | 103,229 | -- | 783 | -- | 137,140 | 1,697 | 1,309 | 20,090 | 9,475 | 62,195 |
| White spruce | 38,705 | -- | -- | -- | -- | 7,322 | 788 | 334 | 13,214 | 5,513 | 11,534 |
| Black spruce | 35,972 | 977 | -- | -- | -- | 17,235 | -- | 156 | 7,238 | 991 | 9,375 |
| Balsam fir | 115,899 | 8,455 | -- | -- | -- | 29,015 | 914 | 751 | 29,863 | 10,254 | 36,647 |
| Hemlock | 64,960 | 1,074 | -- | -- | -- | 9,120 | 290 | 264 | 28,640 | 2,873 | 22,699 |
| Tamarack | 26,795 | 408 | -- | -- | -- | 8,454 | -- | 1,088 | 4,599 | 1,457 | 10,789 |
| Northern white-cedar | 431,116 | 24,272 | -- | -- | -- | 118,421 | 1,636 | 6,112 | 115,261 | 25,650 | 139,764 |
| Other softwoods | 28,428 | 379 | -- | -- | -- | 489 | -- | -- | 14,344 | 2,231 | 10,985 |
| Total | 1,707,051 | 337,271 | -- | 884 | -- | 511,474 | 8,120 | 15,798 | 302,174 | 109,419 | 421,911 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 251,160 | 62,048 | -- | 298 | -- | 49,746 | 1,256 | 1,515 | 17,441 | 27,404 | 91,452 |
| Select red oaks | 721,458 | 39,538 | -- | 74 | -- | 218,228 | 4,511 | 7,569 | 92,702 | 78,099 | 280,737 |
| Other red oaks | 180,189 | 123,580 | -- | 414 | -- | 10,994 | 2,819 | 1,487 | 7,776 | 4,264 | 28,855 |
| Hickory | 1,838 | -- | -- | -- | -- | -- | -- | -- | 1,317 | -- | 521 |
| Yellow birch | 37,604 | 1,112 | -- | -- | -- | 6,188 | -- | 720 | 13,615 | 1,058 | 14,911 |
| Hard maple | 692,984 | 18,900 | -- | -- | -- | 132,820 | 1,882 | 1,753 | 270,133 | 30,527 | 236,969 |
| Soft maple | 748,355 | 59,520 | -- | -- | -- | 180,304 | 6,643 | 18,701 | 137,803 | 70,860 | 274,524 |
| Beech | 121,689 | 6,759 | -- | -- | -- | 19,357 | 2,084 | 1,179 | 44,519 | 8,889 | 38,902 |
| Ash | 251,892 | 14,040 | -- | -- | -- | 40,123 | 1,161 | 5,233 | 68,387 | 19,751 | 103,197 |
| Balsam poplar | 98,083 | 3,298 | -- | -- | -- | 19,941 | 118 | 1,881 | 28,048 | 10,504 | 34,293 |
| Cottonwood | 10,261 | -- | -- | -- | -- | 721 | -- | 1,266 | 1,222 | 854 | 6,198 |
| Bigtooth aspen | 653,639 | 47,407 | -- | -- | -- | 169,966 | 7,361 | 6,394 | 113,192 | 50,339 | 258,980 |
| Quaking aspen | 630,943 | 44,600 | -- | 3,287 | -- | 158,196 | 3,161 | 6,145 | 125,556 | 47,568 | 242,430 |
| Basswood | 325,173 | 9,885 | -- | -- | -- | 88,713 | -- | 2,404 | 96,007 | 18,893 | 109,271 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 200 |
| Black cherry | 94,087 | 12,609 | -- | -- | -- | 17,936 | 236 | 386 | 30,210 | 5,458 | 27,252 |
| Butternut | 278 | -- | -- | -- | -- | -- | -- | -- | 278 | -- | -- |
| Elm | 30,117 | 2,925 | -- | -- | -- | 7,380 | -- | 280 | 6,900 | 1,413 | 11,219 |
| Paper birch | 256,960 | 8,610 | -- | -- | -- | 71,825 | 248 | 5,621 | 57,479 | 18,835 | 94,342 |
| Other hardwoods | 10,705 | -- | -- | -- | -- | 336 | -- | 212 | 3,542 | 521 | 6,094 |
| Total | 5,117,615 | 454,831 | -- | 4,073 | -- | 1,192,774 | 31,480 | 62,746 | 1,116,127 | 395,237 | 1,860,347 |
| All species | 6,824,666 | 792,102 | -- | 4,957 | -- | 1,704,248 | 39,600 | 78,544 | 1,418,301 | 504,656 | 2,282,258 |

Table 35.--Net volume of sawtimber on commercial forest land by species group and ownership class, Northern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 811,402 | 44,532 | -- | -- | -- | 260,097 | 3,921 | 6,153 | 108,894 | 145,067 | 242,738 |
| Red pine | 1,053,736 | 301,451 | -- | -- | -- | 437,303 | 7,854 | 14,504 | 76,449 | 41,238 | 174,937 |
| Jack pine | 684,828 | 205,686 | -- | 550 | -- | 274,175 | -- | 4,290 | 51,475 | 36,286 | 112,366 |
| White spruce | 121,852 | -- | -- | -- | -- | 19,978 | 2,424 | 904 | 47,647 | 18,692 | 32,207 |
| Black spruce | 41,690 | -- | -- | -- | -- | 10,042 | -- | 597 | 6,872 | 2,755 | 21,424 |
| Balsam fir | 151,930 | 7,974 | -- | -- | -- | 33,215 | 3,100 | 2,332 | 38,990 | 19,848 | 46,471 |
| Hemlock | 252,871 | 3,423 | -- | -- | -- | 31,055 | -- | 1,180 | 114,843 | 11,210 | 91,160 |
| Tamarack | 56,260 | 319 | -- | -- | -- | 9,862 | -- | 1,971 | 9,325 | 5,877 | 28,906 |
| Northern white-cedar | 653,206 | 25,522 | -- | -- | -- | 170,977 | 2,783 | 4,181 | 158,620 | 39,860 | 251,263 |
| Other softwoods | 11,647 | 1,800 | -- | -- | -- | -- | -- | -- | 7,766 | 660 | 1,421 |
| Total | 3,839,422 | 590,707 | -- | 550 | -- | 1,246,704 | 20,082 | 36,112 | 620,881 | 321,493 | 1,002,893 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 572,193 | 126,210 | -- | -- | -- | 103,632 | 1,972 | 4,086 | 52,188 | 81,329 | 202,776 |
| Select red oaks | 2,159,690 | 114,781 | -- | -- | -- | 556,147 | 19,510 | 20,890 | 329,176 | 243,196 | 875,990 |
| Other red oaks | 488,102 | 311,226 | -- | -- | -- | 26,551 | 1,104 | 6,670 | 18,684 | 12,388 | 111,479 |
| Hickory | 5,588 | -- | -- | -- | -- | -- | -- | -- | 3,324 | -- | 2,264 |
| Yellow birch | 77,578 | 554 | -- | -- | -- | 10,761 | -- | 2,141 | 32,463 | 2,827 | 28,832 |
| Hard maple | 1,188,575 | 10,486 | -- | -- | -- | 158,956 | 3,277 | 1,111 | 547,014 | 57,151 | 410,580 |
| Soft maple | 1,450,072 | 95,868 | -- | -- | -- | 298,381 | 9,008 | 45,884 | 292,127 | 184,180 | 524,624 |
| Beech | 389,470 | 9,020 | -- | -- | -- | 56,554 | 7,034 | 5,675 | 145,661 | 25,599 | 139,927 |
| Ash | 487,434 | 13,189 | -- | -- | -- | 71,071 | 1,518 | 11,555 | 149,552 | 38,297 | 202,252 |
| Balsam poplar | 353,766 | 16,924 | -- | -- | -- | 55,707 | -- | 6,279 | 98,215 | 49,792 | 126,849 |
| Cottonwood | 42,830 | -- | -- | -- | -- | 4,087 | -- | 6,805 | 5,630 | 4,720 | 21,588 |
| Bigtooth aspen | 1,339,410 | 60,064 | -- | -- | -- | 343,214 | 20,292 | 17,368 | 270,233 | 112,179 | 516,060 |
| Quaking aspen | 1,366,066 | 83,513 | -- | -- | -- | 337,515 | 2,225 | 13,799 | 295,826 | 102,098 | 531,090 |
| Basswood | 834,836 | 18,131 | -- | -- | -- | 195,397 | -- | 12,005 | 253,191 | 57,964 | 298,148 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 172,403 | 14,653 | -- | -- | -- | 35,825 | 716 | 1,069 | 65,945 | 5,311 | 48,884 |
| Butternut | 1,427 | -- | -- | -- | -- | -- | -- | -- | 1,427 | -- | -- |
| Elm | 44,130 | 8,444 | -- | -- | -- | 6,825 | -- | 829 | 12,684 | 1,548 | 13,800 |
| Paper birch | 233,758 | 10,141 | -- | -- | -- | 76,779 | -- | 2,948 | 56,888 | 16,412 | 70,590 |
| Other hardwoods | 35,432 | -- | -- | -- | -- | 1,761 | -- | 1,090 | 8,628 | 2,016 | 21,937 |
| Total | 11,242,760 | 893,204 | -- | -- | -- | 2,339,163 | 66,656 | 160,204 | 2,638,856 | 997,007 | 4,147,670 |
| All species | 15,082,182 | 1,483,911 | -- | 550 | -- | 3,585,867 | 86,738 | 196,316 | 3,259,737 | 1,318,500 | 5,150,563 |

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[1] International 1/4-inch rule.

## Table 36.--Net volume of growing stock on commercial forest land by forest type and stand-age class, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 335,019 | 10,699 | 25,951 | 19,827 | 70,130 | 94,854 | 49,854 | 20,635 | 32,445 | 5,716 | 2,363 | 1,667 | 878 | -- |
| Red pine | 439,879 | 3,322 | 30,795 | 156,972 | 109,852 | 61,263 | 6,339 | 19,621 | 11,573 | 16,590 | 13,300 | 10,252 | -- | -- |
| White pine | 92,149 | 586 | 5,727 | 3,780 | -- | 7,306 | 10,928 | 1,603 | 12,356 | 15,768 | 22,585 | 2,797 | 8,713 | -- |
| Balsam fir | 49,247 | -- | 6,487 | 866 | -- | 3,587 | 6,672 | 12,918 | 2,016 | 4,712 | -- | 2,215 | 9,774 | -- |
| White spruce | 16,644 | 817 | 3,570 | -- | -- | -- | 1,227 | -- | -- | 6,913 | -- | -- | -- | 4,117 |
| Black spruce | 14,546 | 1,047 | 1,570 | -- | -- | 5,429 | 2,623 | 293 | 3,584 | -- | -- | -- | -- | -- |
| Northern white-cedar | 498,105 | 4,511 | 3,198 | 8,514 | 6,667 | 16,989 | 57,642 | 73,609 | 67,405 | 83,260 | 54,252 | 71,151 | 24,597 | 26,310 |
| Tamarack | 11,983 | 580 | 1,978 | 2,230 | 805 | -- | 2,770 | 1,955 | 661 | -- | -- | 1,004 | -- | -- |
| Oak-hickory | 1,103,048 | 37,940 | 24,474 | 9,378 | 49,592 | 128,522 | 269,432 | 202,655 | 93,602 | 87,562 | 76,111 | 96,799 | 24,798 | 2,183 |
| Elm-ash-soft maple | 403,435 | 23,193 | 16,515 | 7,161 | 35,480 | 50,207 | 44,822 | 56,294 | 45,097 | 35,481 | 22,457 | 44,122 | 22,606 | -- |
| Maple-birch | 2,128,843 | 55,868 | 53,029 | 35,198 | 124,020 | 412,646 | 463,400 | 262,265 | 180,891 | 227,655 | 131,439 | 145,829 | 36,603 | -- |
| Aspen | 1,583,105 | 113,319 | 132,663 | 47,119 | 137,411 | 274,680 | 318,565 | 202,635 | 150,568 | 80,073 | 54,249 | 58,128 | 13,695 | -- |
| Paper birch | 119,367 | 3,433 | 1,359 | 1,637 | 12,134 | 11,254 | 41,232 | 31,926 | 12,726 | 77 | 3,589 | -- | -- | -- |
| Exotic | 27,661 | 269 | 3,704 | 11,291 | 8,940 | 2,130 | 1,327 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 1,635 | 98 | 311 | 247 | -- | 350 | 332 | -- | -- | 297 | -- | -- | -- | -- |
| All types | 6,824,666 | 255,682 | 311,331 | 304,220 | 555,031 | 1,069,217 | 1,277,165 | 886,409 | 612,924 | 564,104 | 380,345 | 433,964 | 141,664 | 32,610 |

Table 37.--Net volume of sawtimber on commercial forest land by forest type and stand-age class, Northern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| | | Stand-age class (years) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Forest type | classes | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 |
| Jack pine | 717,833 | 16,918 | 42,065 | 22,641 | 158,833 | 178,242 | 103,647 | 56,808 | 98,156 | 22,350 |
| Red pine | 853,145 | 3,604 | 40,331 | 139,440 | 205,870 | 129,246 | 28,175 | 79,190 | 48,794 | 67,572 |
| White pine | 374,029 | 1,338 | 25,212 | 777 | -- | 17,788 | 39,959 | 7,100 | 48,752 | 73,214 |
| Balsam fir | 108,087 | -- | 8,260 | 2,556 | -- | 4,943 | 8,973 | 27,489 | 2,044 | 14,904 |
| White spruce | 38,700 | -- | 7,919 | -- | -- | -- | 1,838 | -- | -- | 18,039 |
| Black spruce | 19,698 | 957 | 4,894 | -- | -- | 10,005 | 1,378 | -- | 2,464 | -- |
| Northern white-cedar | 852,157 | 2,537 | 3,703 | 11,236 | 2,982 | 30,571 | 72,464 | 84,954 | 68,391 | 118,767 |
| Tamarack | 26,569 | -- | 6,257 | 5,110 | -- | -- | 3,369 | 5,378 | 3,633 | -- |
| Oak-hickory | 2,602,683 | 96,003 | 63,144 | 18,227 | 79,886 | 239,086 | 385,711 | 403,050 | 250,411 | 291,097 |
| Elm-ash-soft maple | 1,065,831 | 49,475 | 25,752 | 12,396 | 69,553 | 76,965 | 108,189 | 138,618 | 130,655 | 136,640 |
| Maple-birch | 4,956,484 | 124,906 | 120,457 | 48,791 | 213,596 | 650,762 | 733,435 | 662,554 | 515,168 | 718,174 |
| Aspen | 3,297,558 | 178,436 | 218,372 | 71,333 | 207,636 | 423,761 | 575,937 | 502,570 | 434,962 | 251,096 |
| Paper birch | 150,262 | 4,262 | -- | -- | 11,279 | 18,865 | 51,653 | 36,302 | 17,953 | 38 |
| Exotic | 14,999 | -- | 4,393 | 972 | 5,840 | 660 | 3,134 | -- | -- | -- |
| Nonstocked | 4,147 | -- | -- | -- | -- | 1,542 | 1,541 | -- | -- | 1,064 |
| All types | 15,082,182 | 478,436 | 570,759 | 333,479 | 955,475 | 1,782,436 | 2,119,403 | 2,004,013 | 1,621,383 | 1,712,955 |

(Table continued)

(Table 37 continued)

| Forest type | 91-100 | 101-120 | 121-140 | 141+ |
|---|---|---|---|---|
| Jack pine | 10,400 | 5,119 | 2,654 | -- |
| Red pine | 64,582 | 46,341 | -- | -- |
| White pine | 102,070 | 12,801 | 45,018 | -- |
| Balsam fir | -- | 7,373 | 31,545 | -- |
| White spruce | -- | -- | -- | 10,904 |
| Black spruce | -- | -- | -- | -- |
| Northern white-cedar | 127,252 | 182,513 | 73,791 | 72,996 |
| Tamarack | -- | 2,822 | -- | -- |
| Oak-hickory | 298,464 | 369,123 | 98,667 | 9,814 |
| Elm-ash-soft maple | 66,511 | 175,885 | 75,192 | -- |
| Maple-birch | 453,474 | 557,561 | 157,606 | -- |
| Aspen | 182,038 | 205,101 | 46,316 | -- |
| Paper birch | 9,910 | -- | -- | -- |
| Exotic | -- | -- | -- | -- |
| Nonstocked | -- | -- | -- | -- |
| All types | 1,314,701 | 1,564,639 | 530,789 | 93,714 |

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[1] International 1/4-inch rule.

Table 38.--Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Jack pine | | | | | | | | |
| Sawtimber | 71,306 | -- | -- | 1,956 | 3,917 | 6,025 | 4,031 | 19,144 |
| Poletimber | 211,658 | -- | -- | 2,018 | 2,115 | 29,811 | 9,151 | 26,287 |
| Sapling & seedling | 52,055 | 241 | 1,322 | 1,667 | 7,327 | 8,322 | 10,303 | 9,378 |
| All stands | 335,019 | 241 | 1,322 | 5,641 | 13,359 | 44,158 | 23,485 | 54,809 |
| Red pine | | | | | | | | |
| Sawtimber | 103,151 | -- | -- | -- | 3,429 | 5,051 | -- | 8,728 |
| Poletimber | 302,514 | -- | -- | -- | 1,238 | 1,517 | 3,461 | 5,377 |
| Sapling & seedling | 34,214 | 693 | 164 | 575 | 78 | 872 | 11,838 | 3,173 |
| All stands | 439,879 | 693 | 164 | 575 | 4,745 | 7,440 | 15,299 | 17,278 |
| White pine | | | | | | | | |
| Sawtimber | 75,549 | -- | -- | -- | 1,603 | 2,507 | -- | 8,125 |
| Poletimber | 10,287 | -- | -- | -- | -- | -- | 1,677 | 1,648 |
| Sapling & seedling | 6,313 | -- | -- | 1,056 | -- | 1,453 | 1,914 | 1,890 |
| All stands | 92,149 | -- | -- | 1,056 | 1,603 | 3,960 | 3,591 | 11,663 |
| Balsam fir | | | | | | | | |
| Sawtimber | 21,315 | -- | -- | -- | -- | -- | 3,397 | -- |
| Poletimber | 20,579 | -- | -- | -- | -- | 2,958 | 1,505 | 1,469 |
| Sapling & seedling | 7,353 | -- | 325 | -- | -- | 3,016 | -- | -- |
| All stands | 49,247 | -- | 325 | -- | -- | 5,974 | 4,902 | 1,469 |
| White spruce | | | | | | | | |
| Sawtimber | 7,882 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 4,375 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 4,387 | -- | -- | -- | 817 | -- | -- | -- |
| All stands | 16,644 | -- | -- | -- | 817 | -- | -- | -- |
| Black spruce | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 11,636 | -- | -- | 710 | -- | -- | -- | 2,026 |
| Sapling & seedling | 2,910 | 47 | 1,451 | -- | 517 | -- | -- | 602 |
| All stands | 14,546 | 47 | 1,451 | 710 | 517 | -- | -- | 2,628 |
| Northern white-cedar | | | | | | | | |
| Sawtimber | 156,047 | -- | -- | -- | -- | -- | -- | 2,002 |
| Poletimber | 327,142 | -- | -- | -- | 774 | -- | 2,147 | 2,660 |
| Sapling & seedling | 14,916 | -- | 255 | -- | -- | 382 | -- | 1,294 |
| All stands | 498,105 | -- | 255 | -- | 774 | 382 | 2,147 | 5,956 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | 3,621 | -- | -- | 661 | 1,004 | -- | -- | -- |
| Poletimber | 4,747 | -- | -- | -- | -- | -- | -- | 919 |
| Sapling & seedling | 3,615 | -- | -- | 1,037 | -- | -- | -- | 1,350 |
| All stands | 11,983 | -- | -- | 1,698 | 1,004 | -- | -- | 2,269 |
| Oak-hickory | | | | | | | | |
| Sawtimber | 359,955 | 255 | -- | 740 | 4,456 | 14,103 | 15,836 | 39,807 |
| Poletimber | 677,859 | -- | 270 | -- | 2,158 | 24,757 | 51,998 | 66,197 |
| Sapling & seedling | 65,234 | 875 | 7,532 | 6,877 | 10,233 | 17,052 | 10,414 | 9,114 |
| All stands | 1,103,048 | 1,130 | 7,802 | 7,617 | 16,847 | 55,912 | 78,248 | 115,118 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 190,532 | -- | -- | 1,460 | 4,039 | 10,254 | 5,712 | 10,988 |
| Poletimber | 164,149 | -- | 677 | 1,186 | 2,087 | 8,158 | 3,784 | 6,391 |
| Sapling & seedling | 48,754 | 381 | 1,783 | 5,077 | 5,505 | 13,399 | 8,549 | 3,696 |
| All stands | 403,435 | 381 | 2,460 | 7,723 | 11,631 | 31,811 | 18,045 | 21,075 |
| Maple-birch | | | | | | | | |
| Sawtimber | 780,096 | -- | 829 | -- | 3,042 | 15,330 | 13,709 | 29,856 |
| Poletimber | 1,225,439 | -- | 534 | 1,850 | 7,837 | 23,387 | 28,644 | 52,423 |
| Sapling & seedling | 123,308 | 1,766 | 6,534 | 5,393 | 25,199 | 21,204 | 22,922 | 21,989 |
| All stands | 2,128,843 | 1,766 | 7,897 | 7,243 | 36,078 | 59,921 | 65,275 | 104,268 |
| Aspen | | | | | | | | |
| Sawtimber | 485,722 | -- | -- | 417 | 5,205 | 12,962 | 9,966 | 28,238 |
| Poletimber | 827,613 | -- | -- | 1,307 | 11,208 | 27,086 | 32,120 | 80,057 |
| Sapling & seedling | 269,770 | 2,422 | 11,916 | 16,637 | 34,684 | 49,829 | 38,432 | 51,505 |
| All stands | 1,583,105 | 2,422 | 11,916 | 18,361 | 51,097 | 89,877 | 80,518 | 159,800 |
| Paper birch | | | | | | | | |
| Sawtimber | 4,824 | -- | -- | -- | -- | -- | 1,236 | -- |
| Poletimber | 108,114 | -- | -- | -- | 1,007 | 1,897 | 3,859 | 8,377 |
| Sapling & seedling | 6,429 | -- | 108 | -- | 375 | 876 | 1,085 | 2,348 |
| All stands | 119,367 | -- | 108 | -- | 1,382 | 2,773 | 6,180 | 10,725 |
| Exotic | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 22,687 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 4,974 | -- | 269 | 304 | 323 | 162 | -- | -- |
| All stands | 27,661 | -- | 269 | 304 | 323 | 162 | -- | -- |
| Nonstocked | 1,635 | 238 | 1,085 | -- | -- | -- | -- | 312 |
| All types | | | | | | | | |
| Sawtimber | 2,260,000 | 255 | 829 | 5,234 | 26,695 | 66,232 | 53,887 | 146,888 |
| Poletimber | 3,918,799 | -- | 1,481 | 7,071 | 28,424 | 119,571 | 138,346 | 253,831 |
| Sapling & seedling | 644,232 | 6,425 | 31,659 | 38,623 | 85,058 | 116,567 | 105,457 | 106,339 |
| Nonstocked | 1,635 | 238 | 1,085 | -- | -- | -- | -- | 312 |
| All stands | 6,824,666 | 6,918 | 35,054 | 50,928 | 140,177 | 302,370 | 297,690 | 507,370 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | 12,075 | 7,478 | 8,953 | 7,727 | -- | -- | -- |
| Poletimber | 35,441 | 22,838 | 39,630 | 26,384 | 17,983 | -- | -- |
| Sapling & seedling | 5,988 | 2,500 | -- | -- | 5,007 | -- | -- |
| All stands | 53,504 | 32,816 | 48,583 | 34,111 | 22,990 | -- | -- |
| Red pine | | | | | | | |
| Sawtimber | 8,534 | 5,495 | 2,343 | 19,377 | 18,586 | 17,867 | 13,741 |
| Poletimber | 27,784 | 15,601 | 14,360 | 31,050 | 61,216 | 78,891 | 62,019 |
| Sapling & seedling | 10,329 | 4,301 | -- | 1,199 | 992 | -- | -- |
| All stands | 46,647 | 25,397 | 16,703 | 51,626 | 80,794 | 96,758 | 75,760 |
| White pine | | | | | | | |
| Sawtimber | 6,664 | 16,068 | 7,132 | 20,621 | -- | 12,829 | -- |
| Poletimber | 2,402 | 2,428 | -- | 2,132 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 9,066 | 18,496 | 7,132 | 22,753 | -- | 12,829 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | -- | 7,583 | 2,525 | -- | 7,810 | -- |
| Poletimber | 2,245 | -- | -- | 5,117 | 7,285 | -- | -- |
| Sapling & seedling | 1,829 | 2,183 | -- | -- | -- | -- | -- |
| All stands | 4,074 | 2,183 | 7,583 | 7,642 | 7,285 | 7,810 | -- |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | 3,766 | 4,116 | -- | -- | -- |
| Poletimber | -- | 1,227 | -- | 3,148 | -- | -- | -- |
| Sapling & seedling | 2,336 | -- | -- | 1,234 | -- | -- | -- |
| All stands | 2,336 | 1,227 | 3,766 | 8,498 | -- | -- | -- |
| Black spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | 918 | 1,913 | 2,485 | -- | 3,584 | -- |
| Sapling & seedling | -- | -- | -- | -- | 293 | -- | -- |
| All stands | -- | 918 | 1,913 | 2,485 | 293 | 3,584 | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | -- | -- | 10,018 | 16,791 | 33,485 | 34,824 | 58,927 |
| Poletimber | 7,588 | 5,202 | 2,841 | 30,912 | 81,883 | 74,108 | 119,027 |
| Sapling & seedling | 2,729 | -- | 2,846 | 3,861 | 2,980 | 569 | -- |
| All stands | 10,317 | 5,202 | 15,705 | 51,564 | 118,348 | 109,501 | 177,954 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | |
| Sawtimber | 1,956 | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | 1,978 | -- | 1,850 | -- | -- | -- |
| Sapling & seedling | 1,228 | -- | -- | -- | -- | -- | -- |
| All stands | 3,184 | 1,978 | -- | 1,850 | -- | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 45,594 | 52,847 | 58,012 | 73,008 | 44,052 | 11,245 | -- |
| Poletimber | 88,348 | 84,032 | 103,771 | 139,150 | 85,057 | 26,246 | 5,875 |
| Sapling & seedling | 1,015 | 744 | 1,378 | -- | -- | -- | -- |
| All stands | 134,957 | 137,623 | 163,161 | 212,158 | 129,109 | 37,491 | 5,875 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 15,944 | 1,928 | 16,782 | 40,426 | 62,650 | 13,952 | 6,397 |
| Poletimber | 13,743 | 7,032 | 28,470 | 33,400 | 31,661 | 24,386 | 3,174 |
| Sapling & seedling | 4,641 | -- | 2,909 | 2,814 | -- | -- | -- |
| All stands | 34,328 | 8,960 | 48,161 | 76,640 | 94,311 | 38,338 | 9,571 |
| Maple-birch | | | | | | | |
| Sawtimber | 65,208 | 42,724 | 108,124 | 195,930 | 216,873 | 66,330 | 22,141 |
| Poletimber | 89,959 | 81,619 | 142,341 | 317,375 | 304,124 | 155,684 | 19,662 |
| Sapling & seedling | 5,626 | 2,507 | 9,253 | 915 | -- | -- | -- |
| All stands | 160,793 | 126,850 | 259,718 | 514,220 | 520,997 | 222,014 | 41,803 |
| Aspen | | | | | | | |
| Sawtimber | 43,746 | 30,224 | 53,714 | 76,785 | 122,197 | 57,364 | 44,904 |
| Poletimber | 87,115 | 82,191 | 136,218 | 125,919 | 174,084 | 62,622 | 7,686 |
| Sapling & seedling | 22,565 | 7,524 | 15,611 | 7,814 | 10,831 | -- | -- |
| All stands | 153,426 | 119,939 | 205,543 | 210,518 | 307,112 | 119,986 | 52,590 |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | 3,588 | -- | -- | -- | -- |
| Poletimber | 7,045 | 4,305 | 12,374 | 18,575 | 39,427 | 11,248 | -- |
| Sapling & seedling | -- | -- | 1,637 | -- | -- | -- | -- |
| All stands | 7,045 | 4,305 | 17,599 | 18,575 | 39,427 | 11,248 | -- |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,327 | 1,665 | 5,610 | 8,112 | 1,090 | 4,883 | -- |
| Sapling & seedling | 2,360 | -- | 1,133 | -- | 423 | -- | -- |
| All stands | 3,687 | 1,665 | 6,743 | 8,112 | 1,513 | 4,883 | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 199,721 | 156,764 | 280,015 | 457,306 | 497,843 | 222,221 | 146,110 |
| Poletimber | 362,997 | 311,036 | 487,528 | 745,609 | 803,810 | 441,652 | 217,443 |
| Sapling & seedling | 60,646 | 19,759 | 34,767 | 17,837 | 20,526 | 569 | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All stands | 623,364 | 487,559 | 802,310 | 1,220,752 | 1,322,179 | 664,442 | 363,553 |

Table 39.--Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Northern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1/]

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Jack pine | | | | | | | | |
| Sawtimber | 257,582 | -- | -- | 7,462 | 15,233 | 24,128 | 14,833 | 65,586 |
| Poletimber | 381,274 | -- | -- | 2,564 | 4,192 | 94,275 | 17,347 | 42,686 |
| Sapling & seedling | 78,977 | 623 | 2,007 | 1,844 | 9,016 | 14,418 | 16,260 | 29,289 |
| All stands | 717,833 | 623 | 2,007 | 11,870 | 28,441 | 132,821 | 48,440 | 137,561 |
| Red pine | | | | | | | | |
| Sawtimber | 426,672 | -- | -- | -- | 13,572 | 23,089 | -- | 39,565 |
| Poletimber | 375,900 | -- | -- | -- | 3,141 | 2,772 | 4,802 | 6,677 |
| Sapling & seedling | 50,573 | 3,604 | 836 | -- | -- | 766 | 21,892 | 11,905 |
| All stands | 853,145 | 3,604 | 836 | -- | 16,713 | 26,627 | 26,694 | 58,147 |
| White pine | | | | | | | | |
| Sawtimber | 335,291 | -- | -- | -- | 7,100 | 9,508 | -- | 37,198 |
| Poletimber | 12,188 | -- | -- | -- | -- | -- | 2,789 | -- |
| Sapling & seedling | 26,550 | -- | -- | 4,950 | -- | 2,858 | 11,851 | 6,891 |
| All stands | 374,029 | -- | -- | 4,950 | 7,100 | 12,366 | 14,640 | 44,089 |
| Balsam fir | | | | | | | | |
| Sawtimber | 71,158 | -- | -- | -- | -- | -- | 12,550 | -- |
| Poletimber | 26,113 | -- | -- | -- | -- | 3,582 | 1,422 | 1,845 |
| Sapling & seedling | 10,816 | -- | -- | -- | -- | 5,942 | -- | -- |
| All stands | 108,087 | -- | -- | -- | -- | 9,524 | 13,972 | 1,845 |
| White spruce | | | | | | | | |
| Sawtimber | 22,554 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 8,227 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 7,919 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 38,700 | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 13,847 | -- | -- | 1,378 | -- | -- | -- | 6,495 |
| Sapling & seedling | 5,851 | -- | 2,376 | -- | 2,163 | -- | -- | 1,312 |
| All stands | 19,698 | -- | 2,376 | 1,378 | 2,163 | -- | -- | 7,807 |
| Northern white-cedar | | | | | | | | |
| Sawtimber | 451,780 | -- | -- | -- | -- | -- | -- | 5,757 |
| Poletimber | 390,327 | -- | -- | -- | 1,453 | -- | 1,989 | 2,267 |
| Sapling & seedling | 10,050 | -- | 1,175 | -- | -- | -- | -- | 603 |
| All stands | 852,157 | -- | 1,175 | -- | 1,453 | -- | 1,989 | 8,627 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | 47,434 | 25,506 | 34,988 | 22,412 | -- | -- | -- |
| Poletimber | 60,668 | 29,030 | 70,541 | 37,872 | 22,099 | -- | -- |
| Sapling & seedling | 3,947 | 1,573 | -- | -- | -- | -- | -- |
| All stands | 112,049 | 56,109 | 105,529 | 60,284 | 22,099 | -- | -- |
| Red pine | | | | | | | |
| Sawtimber | 35,570 | 27,533 | 7,280 | 76,218 | 76,753 | 62,712 | 64,380 |
| Poletimber | 43,292 | 8,837 | 1,505 | 40,126 | 81,050 | 103,826 | 79,872 |
| Sapling & seedling | -- | 11,570 | -- | -- | -- | -- | -- |
| All stands | 78,862 | 47,940 | 8,785 | 116,344 | 157,803 | 166,538 | 144,252 |
| White pine | | | | | | | |
| Sawtimber | 31,644 | 72,252 | 29,222 | 90,604 | -- | 57,763 | -- |
| Poletimber | 5,383 | 3,239 | -- | 777 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 37,027 | 75,491 | 29,222 | 91,381 | -- | 57,763 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | -- | 27,850 | 7,371 | -- | 23,387 | -- |
| Poletimber | 3,546 | -- | -- | 5,105 | 10,613 | -- | -- |
| Sapling & seedling | 2,556 | 2,318 | -- | -- | -- | -- | -- |
| All stands | 6,102 | 2,318 | 27,850 | 12,476 | 10,613 | 23,387 | -- |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | 11,650 | 10,904 | -- | -- | -- |
| Poletimber | -- | 1,838 | -- | 6,389 | -- | -- | -- |
| Sapling & seedling | 7,919 | -- | -- | -- | -- | -- | -- |
| All stands | 7,919 | 1,838 | 11,650 | 17,293 | -- | -- | -- |
| Black spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | 1,138 | -- | 2,372 | -- | 2,464 | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | 1,138 | -- | 2,372 | -- | 2,464 | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | -- | -- | 38,551 | 49,495 | 104,817 | 86,361 | 166,799 |
| Poletimber | 8,542 | 6,022 | 2,265 | 41,719 | 95,467 | 79,323 | 151,280 |
| Sapling & seedling | 3,687 | -- | 2,311 | 1,934 | 340 | -- | -- |
| All stands | 12,229 | 6,022 | 43,127 | 93,148 | 200,624 | 165,684 | 318,079 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | 11,834 | -- | -- | 3,633 | 2,822 | -- | -- | -- |
| Poletimber | 9,625 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 5,110 | -- | -- | -- | -- | -- | -- | 4,556 |
| All stands | 26,569 | -- | -- | 3,633 | 2,822 | -- | -- | 4,556 |
| Oak-hickory | | | | | | | | |
| Sawtimber | 1,357,343 | 1,467 | -- | 2,167 | 20,732 | 56,029 | 72,326 | 155,185 |
| Poletimber | 1,087,836 | -- | 481 | -- | 839 | 32,014 | 97,033 | 121,334 |
| Sapling & seedling | 157,504 | 3,086 | 16,611 | 9,838 | 24,853 | 54,632 | 15,509 | 25,789 |
| All stands | 2,602,683 | 4,553 | 17,092 | 12,005 | 46,424 | 142,675 | 184,868 | 302,308 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 704,434 | -- | -- | 4,666 | 12,127 | 40,314 | 17,416 | 41,000 |
| Poletimber | 271,507 | -- | 1,343 | 2,188 | 810 | 16,294 | 5,014 | 8,329 |
| Sapling & seedling | 89,890 | 394 | 4,008 | 10,882 | 6,613 | 28,299 | 8,135 | 11,527 |
| All stands | 1,065,831 | 394 | 5,351 | 17,736 | 19,550 | 84,907 | 30,565 | 60,856 |
| Maple-birch | | | | | | | | |
| Sawtimber | 2,789,848 | -- | 3,543 | -- | 12,802 | 66,942 | 46,822 | 110,435 |
| Poletimber | 1,900,924 | -- | -- | 2,040 | 3,243 | 41,282 | 46,606 | 88,035 |
| Sapling & seedling | 265,712 | 5,681 | 15,722 | 12,056 | 49,324 | 42,649 | 49,504 | 45,887 |
| All stands | 4,956,484 | 5,681 | 19,265 | 14,096 | 65,369 | 150,873 | 142,932 | 244,357 |
| Aspen | | | | | | | | |
| Sawtimber | 1,594,904 | -- | -- | 1,367 | 19,624 | 48,706 | 33,827 | 111,218 |
| Poletimber | 1,254,102 | -- | -- | 937 | 17,955 | 30,142 | 43,311 | 118,092 |
| Sapling & seedling | 448,552 | 8,692 | 23,113 | 31,107 | 64,304 | 95,497 | 75,174 | 64,051 |
| All stands | 3,297,558 | 8,692 | 23,113 | 33,411 | 101,883 | 174,345 | 152,312 | 293,361 |
| Paper birch | | | | | | | | |
| Sawtimber | 13,775 | -- | -- | -- | -- | -- | 3,865 | -- |
| Poletimber | 132,225 | -- | -- | -- | 2,792 | 3,176 | 2,031 | 12,241 |
| Sapling & seedling | 4,262 | -- | -- | -- | -- | -- | 1,270 | 2,992 |
| All stands | 150,262 | -- | -- | -- | 2,792 | 3,176 | 7,166 | 15,233 |
| Exotic | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 9,634 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 5,365 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 14,999 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 4,147 | -- | 4,147 | -- | -- | -- | -- | -- |
| All types | | | | | | | | |
| Sawtimber | 8,037,175 | 1,467 | 3,543 | 19,295 | 104,012 | 268,716 | 201,639 | 565,944 |
| Poletimber | 5,873,729 | -- | 1,824 | 9,107 | 34,425 | 223,537 | 222,344 | 408,001 |
| Sapling & seedling | 1,167,131 | 22,080 | 65,848 | 70,677 | 156,273 | 245,061 | 199,595 | 204,802 |
| Nonstocked | 4,147 | -- | 4,147 | -- | -- | -- | -- | -- |
| All stands | 15,082,182 | 23,547 | 75,362 | 99,079 | 294,710 | 737,314 | 623,578 | 1,178,747 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | |
| Sawtimber | 5,379 | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | 6,256 | -- | 3,369 | -- | -- | -- |
| Sapling & seedling | 554 | -- | -- | -- | -- | -- | -- |
| All stands | 5,933 | 6,256 | -- | 3,369 | -- | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 167,359 | 192,540 | 195,147 | 266,493 | 180,228 | 47,670 | -- |
| Poletimber | 151,841 | 144,919 | 149,407 | 229,376 | 120,242 | 39,610 | 740 |
| Sapling & seedling | 1,825 | 1,056 | 4,305 | -- | -- | -- | -- |
| All stands | 321,025 | 338,515 | 348,859 | 495,869 | 300,470 | 87,280 | 740 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 58,236 | 7,415 | 82,329 | 142,546 | 227,816 | 54,044 | 16,525 |
| Poletimber | 19,254 | 12,812 | 41,784 | 67,530 | 48,503 | 44,192 | 3,454 |
| Sapling & seedling | 11,117 | -- | 3,259 | 5,656 | -- | -- | -- |
| All stands | 88,607 | 20,227 | 127,372 | 215,732 | 276,319 | 98,236 | 19,979 |
| Maple-birch | | | | | | | |
| Sawtimber | 255,798 | 147,740 | 367,168 | 695,285 | 771,134 | 232,363 | 79,816 |
| Poletimber | 134,519 | 121,232 | 226,036 | 519,265 | 466,227 | 233,261 | 19,178 |
| Sapling & seedling | 13,039 | 7,319 | 21,623 | 2,908 | -- | -- | -- |
| All stands | 403,356 | 276,291 | 614,827 | 1,217,458 | 1,237,361 | 465,624 | 98,994 |
| Aspen | | | | | | | |
| Sawtimber | 142,512 | 102,550 | 171,503 | 244,384 | 409,386 | 180,106 | 129,721 |
| Poletimber | 122,243 | 165,858 | 179,600 | 195,572 | 268,114 | 98,804 | 13,474 |
| Sapling & seedling | 34,733 | 14,869 | 20,045 | 9,523 | 7,444 | -- | -- |
| All stands | 299,488 | 283,277 | 371,148 | 449,479 | 684,944 | 278,910 | 143,195 |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | 9,910 | -- | -- | -- | -- |
| Poletimber | 8,043 | 3,094 | 16,304 | 15,835 | 46,235 | 22,474 | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 8,043 | 3,094 | 26,214 | 15,835 | 46,235 | 22,474 | -- |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3,134 | -- | 1,621 | 4,160 | -- | 719 | -- |
| Sapling & seedling | 2,527 | -- | 2,838 | -- | -- | -- | -- |
| All stands | 5,661 | -- | 4,459 | 4,160 | -- | 719 | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 743,932 | 575,536 | 975,598 | 1,605,712 | 1,770,134 | 744,406 | 457,241 |
| Poletimber | 560,465 | 504,275 | 689,063 | 1,169,467 | 1,158,550 | 624,673 | 267,998 |
| Sapling & seedling | 81,904 | 38,705 | 54,381 | 20,021 | 7,784 | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,386,301 | 1,118,516 | 1,719,042 | 2,795,200 | 2,936,468 | 1,369,079 | 725,239 |

[1] International 1/4-inch rule.

Table 40.--Net volume of sawtimber on c
and log-grade class, Northe

(In thousand

| Species group | All grades | | | | |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| White pine | 811,402 | 30 | | | |
| Red pine | 1,053,736 | 2 | | | |
| Jack pine | 684,828 | | | | |
| White spruce | 121,852 | | | | |
| Black spruce | 41,690 | | | | |
| Balsam fir | 151,930 | | | | |
| Hemlock | 252,871 | | | | |
| Tamarack | 56,260 | | | | |
| Northern white-cedar | 653,206 | | | | |
| Other softwoods | 11,647 | | | | - |
| Total | 3,839,422 | | | | 48 |
| HARDWOODS | | | | | |
| Select white oaks | 572,193 | | | | 577 |
| Select red oaks | 2,159,690 | | | | ,380 |
| Other red oaks | 488,102 | | | | ,601 |
| Hickory | 5,588 | | | | 61 |
| Yellow birch | 77,578 | | | | 6,981 |
| Hard maple | 1,188,575 | | | | 39,417 |
| Soft maple | 1,450,072 | | | | 89,868 |
| Beech | 389,47 | | | | 51,436 |
| Ash | 487,434 | | | | 12,918 |
| Balsam poplar | 353,766 | | | | 72,175 |
| Cottonwood | 42,830 | | | | 2,998 |
| Bigtooth aspen | 1,339,410 | 24,205 | | | 85,953 |
| Quaking aspen | 1,366,066 | 28,237 | 140,032 | 9 | 244,661 |
| Basswood | 834,836 | 138,930 | 271,408 | 394,138 | 30,360 |
| Yellow-poplar | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- |
| Black cherry | 172,403 | 11,731 | 667 | 122,475 | 37,530 |
| Butternut | 1,427 | -- | -- | 1,427 | -- |
| Elm | 44,130 | -- | 17,156 | 23,998 | 2,976 |
| Paper birch | 233,758 | 2,002 | 30,007 | 180,498 | 21,251 |
| Other hardwoods | 35,432 | -- | 5,358 | 28,531 | 1,543 |
| Total | 11,242,760 | 654,774 | 1,982,167 | 7,305,133 | 1,300,686 |
| All species | 15,082,182 | 728,363 | 2,133,088 | 10,774,997 | 1,445,734 |

[1] International 1/4-inch rule.

Table 41.--Net volume of short-log trees on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 1,535 | 517 | 484 | 202 | 257 | -- | -- | 75 | -- | -- | -- |
| Red pine | 260 | 77 | 81 | -- | -- | 102 | -- | -- | -- | -- | -- |
| Jack pine | 1,959 | 1,201 | 157 | 483 | 118 | -- | -- | -- | -- | -- | -- |
| White spruce | 67 | 67 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 132 | 76 | 56 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 835 | 298 | -- | 291 | 88 | -- | -- | -- | 158 | -- | -- |
| Tamarack | 332 | 272 | 60 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 8,799 | 4,142 | 2,219 | 1,416 | 391 | 535 | 96 | -- | -- | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 13,919 | 6,650 | 3,057 | 2,392 | 854 | 637 | 96 | 75 | 158 | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 5,233 | -- | 1,689 | 988 | 655 | -- | 429 | 290 | 891 | 291 | -- |
| Select red oaks | 10,814 | -- | 3,970 | 2,271 | 922 | 1,879 | 465 | 271 | 303 | 733 | -- |
| Other red oaks | 1,930 | -- | 538 | 565 | 442 | 144 | -- | -- | 241 | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 1,325 | -- | 698 | 207 | 420 | -- | -- | -- | -- | -- | -- |
| Hard maple | 9,175 | -- | 2,530 | 1,063 | 843 | 800 | 870 | 332 | 2,216 | 521 | -- |
| Soft maple | 10,020 | -- | 3,370 | 1,853 | 2,091 | 881 | 624 | 851 | 350 | -- | -- |
| Beech | 6,312 | -- | 437 | 1,056 | 502 | 977 | 482 | 974 | 1,474 | 410 | -- |
| Ash | 1,848 | -- | 921 | 138 | 331 | 166 | -- | -- | -- | -- | 292 |
| Balsam poplar | 466 | -- | 236 | -- | 141 | 89 | -- | -- | -- | -- | -- |
| Cottonwood | 92 | -- | -- | -- | -- | -- | -- | 92 | -- | -- | -- |
| Bigtooth aspen | 5,007 | -- | 2,002 | 1,118 | 886 | 405 | 205 | 143 | 248 | -- | -- |
| Quaking aspen | 5,383 | -- | 2,106 | 894 | 1,039 | 624 | 256 | 369 | 95 | -- | -- |
| Basswood | 2,123 | -- | 728 | 453 | 199 | 313 | 277 | 153 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,397 | -- | 427 | 290 | 406 | -- | 274 | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 697 | -- | 108 | 431 | -- | -- | 158 | -- | -- | -- | -- |
| Paper birch | 2,117 | -- | 1,453 | 284 | 118 | 120 | 142 | -- | -- | -- | -- |
| Other hardwoods | 142 | -- | -- | -- | -- | 142 | -- | -- | -- | -- | -- |
| Total | 64,081 | -- | 21,213 | 11,611 | 8,995 | 6,540 | 4,182 | 3,475 | 5,818 | 1,955 | 292 |
| All species | 78,000 | 6,650 | 24,270 | 14,003 | 9,849 | 7,177 | 4,278 | 3,550 | 5,976 | 1,955 | 292 |

Table 42.--Net volume of short-log trees on commercial forest land by species group and diameter class, Northern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0 10.9 | 11.0- 12.9 | 13.0- 14.9 | 15.0- 16.9 | 17.0- 18.9 | 19.0- 20.9 | 21.0- 22.9 | 23.0- 28.9 | 29.0- 38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 6,685 | 2,903 | 1,970 | 742 | 890 | -- | -- | 180 | -- | -- | -- |
| Red pine | 1,122 | 421 | 399 | -- | -- | 302 | -- | -- | -- | -- | -- |
| Jack pine | 9,878 | 6,791 | 698 | 1,889 | 500 | -- | -- | -- | -- | -- | -- |
| White spruce | 430 | 430 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 698 | 452 | 246 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 3,532 | 1,730 | -- | 1,175 | 307 | -- | -- | -- | 320 | -- | -- |
| Tamarack | 1,718 | 1,416 | 302 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 27,288 | 15,058 | 6,882 | 3,511 | 790 | 896 | 151 | -- | -- | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 51,351 | 29,201 | 10,497 | 7,317 | 2,487 | 1,198 | 151 | 180 | 320 | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 14,056 | -- | 4,548 | 2,489 | 1,798 | -- | 1,227 | 910 | 2,308 | 776 | -- |
| Select red oaks | 31,690 | -- | 12,346 | 6,594 | 3,081 | 5,001 | 1,246 | 802 | 913 | 1,707 | -- |
| Other red oaks | 5,669 | -- | 1,579 | 1,645 | 1,247 | 435 | -- | -- | 763 | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 6,549 | -- | 3,286 | 1,250 | 2,013 | -- | -- | -- | -- | -- | -- |
| Hard maple | 20,675 | -- | 6,993 | 3,150 | 2,430 | 1,831 | 1,928 | 662 | 3,130 | 551 | -- |
| Soft maple | 29,606 | -- | 10,019 | 5,652 | 6,015 | 2,288 | 1,802 | 2,910 | 920 | -- | -- |
| Beech | 16,487 | -- | 1,190 | 2,964 | 1,303 | 2,520 | 1,245 | 2,561 | 4,019 | 685 | -- |
| Ash | 4,933 | -- | 2,758 | 369 | 847 | 430 | -- | -- | -- | -- | 529 |
| Balsam poplar | 1,177 | -- | 621 | -- | 388 | 168 | -- | -- | -- | -- | -- |
| Cottonwood | 337 | -- | -- | -- | -- | -- | -- | 337 | -- | -- | -- |
| Bigtooth aspen | 12,677 | -- | 5,899 | 2,582 | 2,063 | 966 | 410 | 314 | 443 | -- | -- |
| Quaking aspen | 13,782 | -- | 5,739 | 2,559 | 2,547 | 1,516 | 553 | 715 | 153 | -- | -- |
| Basswood | 5,125 | -- | 2,173 | 1,201 | 447 | 803 | 122 | 379 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 3,608 | -- | 1,263 | 618 | 915 | -- | 812 | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,878 | -- | 334 | 1,111 | -- | -- | 433 | -- | -- | -- | -- |
| Paper birch | 6,693 | -- | 4,613 | 867 | 370 | 384 | 459 | -- | -- | -- | -- |
| Other hardwoods | 379 | -- | -- | -- | -- | 379 | -- | -- | -- | -- | -- |
| Total | 175,321 | -- | 63,361 | 33,051 | 25,464 | 16,721 | 10,237 | 9,590 | 12,649 | 3,719 | 529 |
| All species | 226,672 | 29,201 | 73,858 | 40,368 | 27,951 | 17,919 | 10,388 | 9,770 | 12,969 | 3,719 | 529 |

---

[1] International 1/4-inch rule.

Table 43.--Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, Northern Lower Peninsula, Michigan, 1965[1] and 1979

(In million cubic feet)

| Species | 1965[1] | 1979 |
|---|---|---|
| Softwoods | 54.7 | 76.4 |
| Hardwoods | 141.0 | 186.6 |
| All species | 195.7 | 263.0 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 44.--Net annual growth of growing stock on commercial forest land by species group and county, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 7,359 | 308 | 262 | 35 | 60 | -- | 16 | 203 | 409 | 177 | 200 | 35 |
| Red pine | 32,209 | 955 | 113 | 30 | 11 | -- | 956 | 354 | 1,045 | 988 | 1,013 | 235 |
| Jack pine | 14,588 | 328 | 94 | -- | 99 | -- | -- | -6 | 514 | 774 | 2,040 | -- |
| White spruce | 2,483 | 166 | 664 | 1 | -- | -- | -- | 138 | 247 | -- | -- | 63 |
| Black spruce | 1,081 | 2 | 7 | -75 | -- | -- | 6 | 28 | 61 | -- | 5 | 35 |
| Balsam fir | 1,591 | 221 | 76 | -115 | 135 | -- | 18 | 161 | -93 | 63 | 47 | 93 |
| Hemlock | 1,360 | 11 | 7 | 53 | -- | -- | 131 | 33 | 38 | 4 | 12 | 41 |
| Tamarack | -1,568 | 1 | -24 | -99 | -2 | -- | -12 | 33 | -103 | -6 | -12 | -343 |
| Northern white-cedar | 14,711 | 394 | 1,016 | 340 | 157 | -- | 146 | 1,008 | 1,542 | 597 | 127 | 740 |
| Other softwoods | 2,584 | 1 | 7 | 111 | 160 | -- | 146 | -- | 78 | -- | 1 | -- |
| Total | 76,398 | 2,387 | 2,222 | 281 | 620 | -- | 1,407 | 1,952 | 3,738 | 2,597 | 3,433 | 899 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 5,645 | 171 | 27 | -- | 11 | 6 | 6 | -- | 19 | 252 | 302 | -- |
| Select red oaks | 21,281 | 1,968 | 758 | -- | 347 | 4 | 14 | 62 | 309 | 811 | 1,796 | 131 |
| Other red oaks | 4,565 | 399 | -- | -- | 54 | -- | -- | -- | 139 | 285 | 270 | -- |
| Hickory | 50 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- |
| Yellow birch | 799 | 16 | -- | 44 | 10 | -- | -40 | 187 | 23 | -- | -- | 46 |
| Hard maple | 23,690 | 191 | 50 | 2,237 | 27 | -- | 1,459 | 1,133 | 2,047 | 26 | 568 | 2,692 |
| Soft maple | 42,752 | 1,633 | 1,512 | 996 | 961 | 144 | 1,221 | 423 | 1,852 | 2,092 | 1,140 | 1,464 |
| Beech | 1,378 | 74 | -- | 193 | -6 | -- | -22 | 31 | 43 | 37 | 40 | 146 |
| Ash | 13,059 | 993 | 421 | 303 | 738 | 289 | 205 | 784 | 578 | 263 | 16 | 766 |
| Balsam poplar | 1,226 | 170 | 299 | 31 | 24 | -- | -- | 19 | 107 | 6 | 18 | 204 |
| Cottonwood | 322 | -- | -- | -- | 18 | 25 | -- | -- | -- | 10 | -- | -- |
| Bigtooth aspen | 28,441 | 946 | 1,625 | 994 | 563 | 80 | 143 | 435 | 1,797 | 1,380 | 517 | 476 |
| Quaking aspen | 20,759 | 769 | 734 | 462 | 464 | 65 | 383 | 54 | 1,032 | 907 | 765 | 635 |
| Basswood | 9,876 | 410 | 50 | 841 | 30 | 39 | 285 | 1,094 | 1,648 | 17 | 112 | 488 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 5,876 | 152 | 7 | 145 | 32 | -- | 539 | 34 | 14 | 257 | 206 | 360 |
| Butternut | 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -2,502 | -39 | -24 | -414 | 74 | 76 | -30 | -455 | -213 | -3 | -7 | -69 |
| Paper birch | 9,155 | 710 | 811 | 29 | 269 | 189 | 51 | 200 | 620 | 391 | 83 | 195 |
| Other hardwoods | 267 | 11 | -- | -- | 27 | -- | -- | -- | -5 | 4 | 7 | -- |
| Total | 186,649 | 8,574 | 6,270 | 5,861 | 3,643 | 917 | 4,214 | 4,001 | 10,010 | 6,737 | 5,833 | 7,534 |
| All species | 263,047 | 10,961 | 8,492 | 6,142 | 4,263 | 917 | 5,621 | 5,953 | 13,748 | 9,334 | 9,266 | 8,433 |

(Table 44 continued on next page)

(Table 44 continued)

| Species group | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 231 | 310 | 261 | 21 | 176 | 423 | 77 | 218 | 116 | 216 | 221 | 416 |
| Red pine | 95 | 1,305 | 2,185 | 26 | 2,388 | 2,866 | 260 | 1,819 | 719 | 162 | 153 | 419 |
| Jack pine | 74 | 339 | 927 | -- | 509 | 991 | -- | 262 | 250 | 9 | 6 | 82 |
| White spruce | -- | -- | 58 | 4 | 10 | -- | -- | -- | -- | 353 | -- | 25 |
| Black spruce | -- | -4 | -4 | -- | 24 | 2 | 52 | 1 | 2 | -- | -- | 5 |
| Balsam fir | 32 | -- | 137 | -- | 106 | 5 | 3 | 10 | 5 | -- | -- | 6 |
| Hemlock | 3 | 49 | 30 | 39 | 28 | 240 | 21 | 38 | 19 | 52 | 18 | 103 |
| Tamarack | -- | -111 | 10 | -5 | -1 | -9 | -30 | -538 | -9 | -- | -- | 101 |
| Northern white-cedar | 33 | 367 | 337 | 96 | 530 | 371 | 117 | 293 | 49 | 308 | -- | 306 |
| Other softwoods | -- | 13 | -- | 288 | 201 | 359 | -- | 119 | 102 | 29 | -- | 11 |
| Total | 468 | 2,268 | 3,941 | 469 | 3,971 | 5,248 | 500 | 2,222 | 1,253 | 1,129 | 398 | 1,474 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 71 | 157 | 75 | 98 | 32 | 1,047 | -- | 340 | 656 | 97 | 198 | 88 |
| Select red oaks | 381 | 269 | 399 | 185 | 521 | 1,883 | 79 | 706 | 563 | 148 | 318 | 541 |
| Other red oaks | 83 | 1 | 393 | 14 | -- | 526 | -- | 276 | 271 | 28 | 4 | 10 |
| Hickory | 4 | 4 | -- | -- | -- | -- | -- | -- | -- | 6 | 11 | -- |
| Yellow birch | 3 | 21 | 5 | -- | 57 | 4 | 9 | 11 | 17 | 19 | 8 | 3 |
| Hard maple | -- | 651 | 25 | 7 | 1,488 | 76 | 1,329 | 966 | 175 | 116 | 4 | 548 |
| Soft maple | 2,087 | 1,029 | 1,547 | 827 | 1,507 | 1,502 | 139 | 1,902 | 775 | 785 | 1,725 | 1,773 |
| Beech | -- | -15 | 2 | 1 | 2 | 27 | -7 | 12 | 20 | 5 | 210 | 181 |
| Ash | 601 | 21 | 499 | 441 | 199 | 149 | 972 | 214 | 91 | 290 | 496 | 342 |
| Balsam poplar | 105 | -3 | 48 | -30 | -- | 5 | 2 | 2 | 1 | -1 | -4 | 10 |
| Cottonwood | 24 | -- | 8 | 18 | -- | -- | -- | -- | -- | -- | 29 | 7 |
| Bigtooth aspen | 1,376 | 562 | 538 | 1,135 | 606 | 1,287 | 53 | 361 | 974 | 1,055 | 1,652 | 1,438 |
| Quaking aspen | 1,827 | 352 | 448 | 568 | 592 | 422 | 11 | 510 | 776 | 386 | 702 | 727 |
| Basswood | 32 | 96 | 47 | 17 | 973 | 116 | 291 | 119 | 33 | 104 | 74 | 105 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 37 | 76 | 206 | 21 | 207 | 198 | 15 | 440 | 204 | 491 | 25 | 145 |
| Butternut | -- | -- | -- | 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -153 | -50 | -40 | -8 | -156 | -94 | -103 | -57 | -58 | -119 | 62 | -59 |
| Paper birch | 683 | 132 | 176 | 395 | 60 | 31 | 21 | 96 | 46 | 126 | 505 | 470 |
| Other hardwoods | 13 | -- | 62 | 6 | -- | 12 | -- | 22 | 15 | -- | 17 | 4 |
| Total | 7,174 | 3,303 | 4,438 | 3,698 | 6,088 | 7,191 | 2,811 | 5,920 | 4,559 | 3,536 | 6,036 | 6,333 |
| All species | 7,642 | 5,571 | 8,379 | 4,167 | 10,059 | 12,439 | 3,311 | 8,142 | 5,812 | 4,665 | 6,434 | 7,807 |

(Table 44 continued on next page)

(Table 44 continued)

| Species group | County | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| SOFTWOODS | | | | | | | | | | |
| White pine | 158 | 600 | 189 | 65 | 269 | 307 | 682 | 95 | 362 | 241 |
| Red pine | 1,193 | 2,671 | 544 | 192 | -- | 1,948 | 1,665 | 721 | 587 | 4,591 |
| Jack pine | 825 | 521 | 87 | 1,075 | 20 | 1,815 | 455 | 1,037 | 1,030 | 431 |
| White spruce | 213 | -- | 131 | 33 | 23 | 73 | 70 | 173 | 38 | -- |
| Black spruce | -10 | 2 | 2 | -3 | -13 | -4 | 359 | 223 | 259 | 119 |
| Balsam fir | 240 | 7 | 5 | 31 | -68 | 280 | -6 | 234 | -26 | -16 |
| Hemlock | 16 | 63 | 81 | 8 | 113 | -- | 21 | 31 | 4 | 53 |
| Tamarack | -150 | -21 | -12 | -- | -122 | 1 | 2 | -62 | -11 | -34 |
| Northern white-cedar | 514 | 227 | 77 | 345 | 494 | 132 | 304 | 1,682 | 1,407 | 655 |
| Other softwoods | 122 | 332 | 43 | -- | 13 | 1 | -- | 6 | -- | 441 |
| Total | 3,121 | 4,402 | 1,147 | 1,746 | 729 | 4,553 | 3,552 | 4,140 | 3,650 | 6,481 |
| HARDWOODS | | | | | | | | | | |
| Select white oaks | 63 | 889 | 262 | 43 | 23 | 139 | 14 | 15 | 433 | 111 |
| Select red oaks | 1,302 | 1,322 | 417 | 1,130 | 423 | 1,030 | 288 | 608 | 2,220 | 348 |
| Other red oaks | 14 | 940 | 218 | 35 | -- | 433 | 47 | -- | 18 | 107 |
| Hickory | -- | 21 | -- | -- | 2 | -- | -- | -- | -- | -- |
| Yellow birch | -- | 174 | 30 | 10 | 37 | 4 | 38 | 23 | 9 | 31 |
| Hard maple | 1,108 | 265 | 368 | 125 | 600 | 543 | 3,003 | 450 | 39 | 1,374 |
| Soft maple | 1,738 | 2,126 | 1,198 | 1,290 | 1,256 | 938 | 1,223 | 736 | 1,690 | 1,521 |
| Beech | 183 | 9 | 21 | 4 | 9 | 28 | 45 | 19 | -1 | 87 |
| Ash | 269 | 247 | 341 | 436 | 635 | 211 | 351 | 504 | 274 | 120 |
| Balsam poplar | -24 | -- | 28 | -85 | 13 | 32 | 63 | 167 | 11 | 8 |
| Cottonwood | -- | 5 | 167 | -- | 11 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 573 | 1,029 | 587 | 1,391 | 697 | 760 | 511 | 759 | 956 | 1,185 |
| Quaking aspen | 691 | 598 | 206 | 1,008 | 437 | 691 | 777 | 1,433 | 619 | 708 |
| Basswood | 593 | 158 | 69 | 77 | 127 | 132 | 1,286 | 187 | 39 | 187 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3 |
| Black cherry | 48 | 396 | 338 | 87 | 333 | 70 | 295 | -- | 99 | 399 |
| Butternut | -- | 4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -46 | -32 | -33 | -32 | 67 | -- | -365 | -82 | -- | -40 |
| Paper birch | 724 | 47 | 70 | 463 | 309 | 307 | 177 | 434 | 169 | 166 |
| Other hardwoods | -- | 29 | 39 | 6 | -2 | -- | -- | -- | -- | -- |
| Total | 7,236 | 8,227 | 4,326 | 5,988 | 4,977 | 5,318 | 7,753 | 5,253 | 6,575 | 6,315 |
| All species | 10,357 | 12,629 | 5,473 | 7,734 | 5,706 | 9,871 | 11,305 | 9,393 | 10,225 | 12,796 |

(Table 45 continued)

| Species group | County | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 1,944 | 849 | 1,101 | 81 | 810 | 2,690 | 385 | 1,079 | 1,219 | 829 | 1,771 | 1,610 |
| Red pine | 376 | 1,722 | 5,451 | 51 | 3,353 | 7,042 | -- | 3,324 | 1,811 | 339 | 423 | 270 |
| Jack pine | 248 | 1,945 | 3,802 | -- | 2,679 | 2,079 | -- | 253 | 425 | 28 | -- | 224 |
| White spruce | -- | -- | 130 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -11 | -- | -- | -- | -- | -- | -- | -20 |
| Balsam fir | 751 | -- | 748 | -- | 199 | -- | -- | -- | -- | -- | -- | -48 |
| Hemlock | 20 | 155 | 191 | 174 | 113 | 76 | 106 | 73 | 81 | 266 | 94 | 10 |
| Tamarack | -- | 476 | 98 | -20 | -- | 1 | -35 | -2,616 | -- | -- | -- | -4 |
| Northern white-cedar | 50 | 1,515 | 1,081 | 561 | 1,468 | 200 | 667 | 98 | 72 | 934 | -- | 1,938 |
| Other softwoods | -- | -- | 2 | 628 | -- | 777 | -- | -- | 785 | -- | -- | 719 |
| Total | 3,389 | 6,662 | 12,604 | 1,475 | 8,611 | 12,865 | 1,123 | 2,211 | 4,393 | 2,396 | 2,288 | 4,699 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 173 | 409 | 975 | 377 | 67 | 6,834 | -- | 2,130 | 1,141 | 411 | 2,296 | 266 |
| Select red oaks | 740 | 2,437 | 874 | 778 | 932 | 8,644 | 1,159 | 1,573 | 2,752 | 3,031 | 1,780 | 3,809 |
| Other red oaks | 892 | 5 | 677 | 91 | -- | 2,499 | -- | 1,247 | 1,066 | 121 | 23 | 62 |
| Hickory | 31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 34 | -- |
| Yellow birch | 16 | 46 | 24 | -- | 1,578 | 1 | 27 | -- | 13 | -- | 21 | 19 |
| Hard maple | -- | 749 | 59 | 21 | 4,111 | 202 | 4,408 | 6,237 | 406 | 408 | -- | 2,644 |
| Soft maple | 1,875 | 2,343 | 4,273 | 2,253 | 645 | 2,084 | 206 | 11,374 | 2,939 | 1,668 | 7,255 | 8,445 |
| Beech | -- | -86 | -- | 1 | -52 | 841 | -129 | -38 | 10 | -- | -17 | 107 |
| Ash | 1,147 | -127 | 411 | 820 | 850 | 1,236 | 4,699 | 1,348 | 114 | 435 | 2,173 | 2,474 |
| Balsam poplar | 24 | -76 | 1,243 | -168 | -- | 14 | -- | 7 | -1 | -10 | -31 | -12 |
| Cottonwood | 61 | -- | 43 | 93 | -- | -- | -- | -- | -- | -- | 127 | 36 |
| Bigtooth aspen | 6,768 | 2,680 | 645 | 3,247 | 1,039 | 3,555 | 63 | 356 | 421 | 3,247 | 8,426 | 2,548 |
| Quaking aspen | 9,290 | 3,775 | 5,380 | 1,281 | 2,796 | 622 | 46 | 1,431 | 1,581 | 256 | 3,469 | 1,511 |
| Basswood | 79 | 1,368 | 194 | 39 | 1,876 | 1,516 | 1,968 | 299 | 119 | 1,057 | 272 | 312 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 103 | -- | 52 | 318 | 531 | -- | 1,607 | 173 | 5 | -- | 85 |
| Butternut | -- | -- | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -100 | -183 | -82 | -- | -193 | -183 | -144 | -97 | 918 | -250 | -- | -148 |
| Paper birch | 38 | 56 | -32 | -- | 34 | 87 | 55 | 980 | 21 | 1,091 | 993 | 3,091 |
| Other hardwoods | 837 | -- | 295 | 31 | -- | -- | -- | -- | -- | -- | 883 | 23 |
| Total | 21,871 | 13,499 | 14,979 | 8,933 | 14,001 | 28,483 | 12,358 | 28,454 | 11,673 | 11,470 | 27,704 | 25,272 |
| All species | 25,260 | 20,161 | 27,583 | 10,408 | 22,612 | 41,348 | 13,481 | 30,665 | 16,066 | 13,866 | 29,992 | 29,971 |

(Table 45 continued on next page)

Table 45.--Net annual growth of sawtimber on commercial forest land by species group and county, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1/]

| Species group | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 39,030 | 1,753 | 2,442 | 203 | 232 | -- | 46 | 1,026 | 1,763 | 925 | 819 | 160 |
| Red pine | 73,439 | 1,929 | 338 | 9 | 55 | -- | -- | 1,248 | 4,578 | 423 | 4,660 | 776 |
| Jack pine | 56,093 | 3,221 | 116 | -- | 937 | -- | -- | 23 | 2,944 | 3,022 | 8,496 | -- |
| White spruce | 7,748 | 360 | 1,730 | 5 | -- | -- | -- | 541 | 778 | -- | -- | 108 |
| Black spruce | -55 | 24 | -- | -266 | -- | -- | -- | 9 | 35 | -- | 408 | -139 |
| Balsam fir | 7,348 | 1,318 | 661 | 41 | -- | -- | -- | 144 | 626 | 77 | 19 | 2,112 |
| Hemlock | 5,597 | 75 | 39 | 288 | -- | -- | 174 | 141 | 195 | 22 | 77 | 213 |
| Tamarack | -1,882 | -- | -23 | -3 | -5 | -- | 23 | -4 | -82 | -26 | -38 | -- |
| Northern white-cedar | 32,964 | 667 | 2,043 | 1,700 | 12 | -- | 112 | 1,150 | 2,225 | 822 | 72 | 218 |
| Other softwoods | 4,288 | 7 | -- | 644 | 6 | -- | 660 | -- | -- | -- | 2 | -- |
| Total | 224,570 | 9,354 | 7,346 | 2,621 | 1,237 | -- | 1,015 | 4,278 | 13,062 | 5,265 | 14,515 | 3,448 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 25,985 | 1,520 | 66 | -- | 14 | 38 | -- | -- | 36 | 2,910 | 290 | -- |
| Select red oaks | 113,864 | 10,482 | 4,595 | -- | 653 | -- | 66 | 950 | 2,279 | 6,156 | 11,263 | 443 |
| Other red oaks | 17,573 | 953 | -- | -- | 175 | -- | -- | -- | 49 | 1,467 | 412 | -- |
| Hickory | 128 | -- | -- | -- | -- | -- | -- | -- | -- | 11 | -- | -- |
| Yellow birch | 3,846 | -- | -- | 31 | -- | -- | -126 | 22 | 44 | -- | -- | 45 |
| Hard maple | 69,970 | 1,177 | 102 | 4,312 | -- | -- | 9,560 | 4,408 | 4,786 | 110 | 1,165 | 11,183 |
| Soft maple | 109,124 | 7,817 | 3,286 | 4,080 | 2,885 | 270 | 3,473 | 492 | 1,284 | 3,622 | 169 | 448 |
| Beech | 2,969 | 63 | -- | 149 | -27 | -- | -132 | 11 | 958 | 89 | 4 | 891 |
| Ash | 38,964 | 3,158 | 1,067 | 1,501 | 3,736 | 577 | 457 | 2,557 | 417 | 210 | 43 | 722 |
| Balsam poplar | 10,606 | 3,382 | 1,256 | -2 | 1,203 | -- | -- | 1,167 | -78 | -17 | 16 | 80 |
| Cottonwood | 1,025 | -- | -- | -- | 95 | 108 | -- | -- | -- | 37 | -- | -- |
| Bigtooth aspen | 111,076 | 2,722 | 7,903 | 4,877 | 3,592 | 223 | 1,374 | 1,938 | 10,035 | 5,006 | 549 | 4,754 |
| Quaking aspen | 90,673 | 6,257 | 1,130 | 1,816 | 5,745 | 41 | 1,103 | -6 | 5,963 | 4,853 | 273 | 6,645 |
| Basswood | 50,875 | 3,682 | 109 | 3,113 | 63 | -- | 5,073 | 6,450 | 3,646 | 37 | 1,311 | 3,228 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 12,076 | 214 | -- | 147 | -- | -- | 795 | -- | -- | 1,178 | -- | 670 |
| Butternut | 43 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -1,315 | -- | -- | -479 | -- | -- | -80 | -1,059 | -154 | -- | -- | -- |
| Paper birch | 19,022 | 1,840 | 2,918 | -3 | 953 | -- | 847 | 1,089 | 1,044 | 94 | 970 | 124 |
| Other hardwoods | 2,273 | 59 | -- | -- | 92 | -- | -- | -- | -28 | 12 | -- | -- |
| Total | 678,777 | 43,326 | 22,432 | 19,542 | 19,179 | 1,257 | 22,410 | 18,019 | 30,281 | 25,775 | 16,465 | 29,233 |
| All species | 903,347 | 52,680 | 29,778 | 22,163 | 20,416 | 1,257 | 23,425 | 22,297 | 43,343 | 31,040 | 30,980 | 32,681 |

(Table 45 continued on next page)

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[1/] International 1/4-inch rule.

(Table 45 continued)

| | County | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species group | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| SOFTWOODS | | | | | | | | | | |
| White pine | 1,329 | 2,982 | 1,736 | 131 | 622 | 1,555 | 3,141 | 484 | 2,440 | 873 |
| Red pine | 3,161 | 5,904 | 1,697 | 397 | -- | 7,517 | 1,186 | 2,368 | 3,519 | 9,512 |
| Jack pine | 4,796 | 666 | 170 | 3,265 | 52 | 8,234 | 1,233 | 1,201 | 4,133 | 1,901 |
| White spruce | 2,071 | -- | -- | 718 | -- | 102 | 148 | 1,057 | -- | -- |
| Black spruce | -15 | -- | -- | -- | -55 | -16 | 52 | -60 | -1 | -- |
| Balsam fir | 883 | -- | -- | -120 | -248 | 282 | -316 | 1,137 | -902 | -16 |
| Hemlock | 76 | 218 | 723 | 523 | 585 | 1 | 135 | 125 | 8 | 620 |
| Tamarack | -- | -28 | 1 | -- | -270 | -- | 25 | -37 | 684 | 1 |
| Northern white-cedar | 2,195 | 253 | 86 | 1,459 | 1,460 | 1,596 | 219 | 5,748 | 1,389 | 954 |
| Other softwoods | 30 | 21 | -- | -- | -- | 7 | -- | -- | -- | -- |
| Total | 14,526 | 10,016 | 4,413 | 6,373 | 2,146 | 19,278 | 5,823 | 12,023 | 11,270 | 13,845 |
| HARDWOODS | | | | | | | | | | |
| Select white oaks | 101 | 2,255 | 2,043 | 44 | 61 | 329 | -- | 39 | 707 | 453 |
| Select red oaks | 9,738 | 4,790 | 2,492 | 5,638 | 1,572 | 7,618 | 1,694 | 2,436 | 10,898 | 1,592 |
| Other red oaks | -- | 3,689 | 981 | 165 | -- | 830 | 101 | -- | 18 | 2,050 |
| Hickory | -- | 36 | -- | -- | 16 | -- | -- | -- | -- | -- |
| Yellow birch | -- | 867 | 46 | -- | 45 | -- | 38 | 89 | -3 | 1,003 |
| Hard maple | 1,142 | 346 | 285 | 57 | 3,257 | 1,135 | 4,291 | 274 | -- | 3,135 |
| Soft maple | 682 | 12,039 | 5,220 | 3,436 | 5,962 | 472 | 1,800 | 1,916 | 2,197 | 2,214 |
| Beech | -1 | -48 | 69 | 3 | 46 | -- | 102 | 28 | -- | 127 |
| Ash | 324 | 514 | 1,014 | 290 | 543 | 974 | 406 | 7 | 3,646 | 1,221 |
| Balsam poplar | -185 | -44 | 8 | 786 | -10 | 197 | 893 | 947 | -13 | 30 |
| Cottonwood | -- | 23 | 341 | -- | 61 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 487 | 1,690 | 1,411 | 10,050 | 5,574 | 3,342 | 3,269 | 528 | 5,114 | 3,643 |
| Quaking aspen | 1,091 | 2,436 | 376 | 3,121 | 4,824 | 1,242 | 2,278 | 5,989 | 3,356 | 702 |
| Basswood | 1,934 | 1,340 | 174 | 357 | 557 | 1,029 | 6,626 | 353 | 178 | 2,516 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 143 | 2,512 | 791 | -- | 1,757 | 125 | 96 | -- | -- | 774 |
| Butternut | -- | 26 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,729 | -80 | 16 | -53 | -- | -- | -862 | -- | -- | 169 |
| Paper birch | 108 | 65 | 40 | 117 | 935 | 1,275 | 48 | 29 | 84 | 31 |
| Other hardwoods | -- | 60 | -21 | 30 | -- | -- | -- | -- | -- | -- |
| Total | 17,293 | 32,516 | 15,286 | 24,041 | 25,200 | 18,568 | 20,780 | 12,635 | 26,182 | 19,660 |
| All species | 31,819 | 42,532 | 19,699 | 30,414 | 27,346 | 37,846 | 26,603 | 24,658 | 37,452 | 33,505 |

Table 46.--Net annual growth of growing stock on commercial forest land by species group and ownership class, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 7,359 | 390 | -- | -- | -- | 2,292 | 51 | 64 | 1,031 | 1,073 | 2,458 |
| Red pine | 32,209 | 13,116 | -- | 7 | -- | 7,998 | 144 | 291 | 4,357 | 1,861 | 4,435 |
| Jack pine | 14,588 | 3,374 | -- | 35 | -- | 6,294 | 40 | 38 | 676 | 345 | 3,786 |
| White spruce | 2,483 | -- | -- | -- | -- | 430 | 66 | 13 | 621 | 396 | 957 |
| Black spruce | 1,081 | 16 | -- | -- | -- | 683 | -- | -8 | 223 | -8 | 175 |
| Balsam fir | 1,591 | 341 | -- | -- | -- | -1 | 43 | -43 | 657 | 179 | 415 |
| Hemlock | 1,360 | 24 | -- | -- | -- | 241 | 4 | 4 | 522 | 50 | 515 |
| Tamarack | -1,568 | -76 | -- | -- | -- | -267 | -- | -75 | -313 | -530 | -307 |
| Northern white-cedar | 14,711 | 471 | -- | -- | -- | 4,820 | 28 | 223 | 3,949 | 594 | 4,626 |
| Other softwoods | 2,584 | 4 | -- | -- | -- | 107 | -- | -- | 939 | 194 | 1,340 |
| Total | 76,398 | 17,660 | -- | 42 | -- | 22,597 | 376 | 507 | 12,662 | 4,154 | 18,400 |
| HARDWOODS | | | | | | | | | | | |
| Select white oak | 5,645 | 1,230 | -- | 13 | -- | 993 | 23 | 29 | 341 | 482 | 2,534 |
| Select red oaks | 21,281 | 723 | -- | 7 | -- | 6,610 | 110 | 302 | 2,779 | 2,129 | 8,621 |
| Other red oaks | 4,565 | 2,936 | -- | 22 | -- | 431 | 60 | 33 | 193 | 113 | 777 |
| Hickory | 50 | -- | -- | -- | -- | -- | -- | -- | 36 | -- | 14 |
| Yellow birch | 799 | 4 | -- | -- | -- | 239 | -- | 14 | 195 | 22 | 325 |
| Hard maple | 23,690 | 981 | -- | -- | -- | 5,562 | 41 | 56 | 8,057 | 816 | 8,177 |
| Soft maple | 42,752 | 2,199 | -- | -- | -- | 11,757 | 627 | 883 | 7,951 | 3,333 | 16,002 |
| Beech | 1,378 | 123 | -- | -- | -- | 179 | 12 | 1 | 385 | 59 | 619 |
| Ash | 13,059 | 162 | -- | -- | -- | 2,595 | 40 | 315 | 3,455 | 988 | 5,504 |
| Balsam poplar | 1,226 | 50 | -- | -- | -- | 364 | 3 | 24 | 314 | 26 | 445 |
| Cottonwood | 322 | -- | -- | -- | -- | 12 | -- | 4 | 44 | 20 | 242 |
| Bigtooth aspen | 28,441 | 2,336 | -- | -- | -- | 7,459 | 297 | 210 | 4,660 | 2,296 | 11,183 |
| Quaking aspen | 20,759 | 1,171 | -- | 108 | -- | 5,075 | 227 | 135 | 4,138 | 1,880 | 8,025 |
| Basswood | 9,876 | 251 | -- | -- | -- | 2,937 | -- | 50 | 3,459 | 437 | 2,742 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3 |
| Black cherry | 5,876 | 617 | -- | -- | -- | 1,130 | 21 | 13 | 1,662 | 634 | 1,799 |
| Butternut | 7 | -- | -- | -- | -- | -- | -- | -- | 7 | -- | -- |
| Elm | -2,502 | 95 | -- | -- | -- | -799 | -- | -34 | -705 | -35 | -1,024 |
| Paper birch | 9,155 | 186 | -- | -- | -- | 2,232 | 17 | 294 | 2,076 | 950 | 3,400 |
| Other hardwoods | 267 | -- | -- | -- | -- | -1 | -- | 4 | 90 | 7 | 167 |
| Total | 186,649 | 13,064 | -- | 150 | -- | 46,775 | 1,478 | 2,333 | 39,137 | 14,157 | 69,555 |
| All species | 263,047 | 30,724 | -- | 192 | -- | 69,372 | 1,854 | 2,840 | 51,799 | 18,311 | 87,955 |

## Table 47.--Net annual growth of sawtimber on commercial forest land by species group and ownership class, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 39,030 | 2,056 | -- | -- | -- | 11,516 | 854 | 218 | 5,631 | 5,027 | 13,728 |
| Red pine | 73,439 | 29,698 | -- | -- | -- | 22,836 | 297 | 230 | 6,174 | 4,531 | 9,673 |
| Jack pine | 56,093 | 15,477 | -- | 23 | -- | 27,126 | -- | 139 | 3,025 | 843 | 9,460 |
| White spruce | 7,748 | -- | -- | -- | -- | 1,878 | 142 | 13 | 2,614 | 774 | 2,327 |
| Black spruce | -55 | -- | -- | -- | -- | 317 | -- | -32 | -186 | -30 | -124 |
| Balsam fir | 7,348 | 212 | -- | -- | -- | -1,013 | 752 | -239 | 5,208 | 638 | 1,790 |
| Hemlock | 5,597 | 78 | -- | -- | -- | 481 | -- | 25 | 2,324 | 205 | 2,484 |
| Tamarack | -1,882 | 5 | -- | -- | -- | 621 | -- | -86 | -342 | -2,606 | 526 |
| Northern white-cedar | 32,964 | 880 | -- | -- | -- | 7,403 | 42 | 622 | 7,220 | 1,274 | 15,523 |
| Other softwoods | 4,288 | 19 | -- | -- | -- | -- | -- | -- | 2,187 | 661 | 1,421 |
| Total | 224,570 | 48,425 | -- | 23 | -- | 71,165 | 2,087 | 890 | 33,855 | 11,317 | 56,808 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 25,985 | 5,299 | -- | -- | -- | 4,616 | 44 | 79 | 3,772 | 4,476 | 7,699 |
| Select red oaks | 113,864 | 3,065 | -- | -- | -- | 34,268 | 498 | 2,133 | 18,956 | 11,142 | 43,802 |
| Other red oaks | 17,573 | 10,514 | -- | -- | -- | 1,403 | 23 | 133 | 1,129 | 1,217 | 3,154 |
| Hickory | 128 | -- | -- | -- | -- | -- | -- | -- | 63 | -- | 65 |
| Yellow birch | 3,846 | 5 | -- | -- | -- | 68 | -- | 36 | 2,701 | 59 | 977 |
| Hard maple | 69,970 | 801 | -- | -- | -- | 12,061 | 62 | 13 | 27,254 | 2,771 | 27,008 |
| Soft maple | 109,124 | 5,158 | -- | -- | -- | 24,900 | 217 | 2,376 | 20,534 | 8,352 | 47,587 |
| Beech | 2,969 | 120 | -- | -- | -- | 173 | 39 | 7 | 1,211 | 1,634 | -215 |
| Ash | 38,964 | 543 | -- | -- | -- | 5,857 | 753 | 389 | 5,929 | 2,372 | 23,121 |
| Balsam poplar | 10,606 | 624 | -- | -- | -- | 3,255 | -- | 11 | -620 | 1,810 | 5,526 |
| Cottonwood | 1,025 | -- | -- | -- | -- | 67 | -- | 21 | 169 | 106 | 662 |
| Bigtooth aspen | 111,076 | 4,121 | -- | -- | -- | 30,776 | 3,823 | 1,125 | 15,762 | 8,628 | 46,841 |
| Quaking aspen | 90,673 | 4,243 | -- | -- | -- | 20,343 | 1,076 | 1,185 | 22,661 | 3,245 | 37,920 |
| Basswood | 50,875 | 439 | -- | -- | -- | 14,384 | -- | 1,244 | 11,123 | 5,360 | 18,325 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 12,076 | 1,174 | -- | -- | -- | 2,191 | 17 | 32 | 4,430 | 371 | 3,861 |
| Butternut | 43 | -- | -- | -- | -- | -- | -- | -- | 43 | -- | -- |
| Elm | -1,315 | 234 | -- | -- | -- | -747 | -- | -112 | 452 | -152 | -990 |
| Paper birch | 19,022 | 272 | -- | -- | -- | 6,134 | -- | 52 | 4,122 | 203 | 8,239 |
| Other hardwoods | 2,273 | -- | -- | -- | -- | 856 | -- | 23 | 183 | 25 | 1,186 |
| Total | 678,777 | 36,612 | -- | -- | -- | 160,605 | 6,552 | 8,747 | 139,874 | 51,619 | 274,768 |
| All species | 903,347 | 85,037 | -- | 23 | -- | 231,770 | 8,639 | 9,637 | 173,729 | 62,936 | 331,576 |

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[1] International 1/4-inch rule.

Table 48.--Net annual growth of growing stock on commercial forest land by species group and forest type, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All types | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 7,359 | 237 | 664 | 1,846 | 103 | 10 | 50 | 324 |
| Red pine | 32,209 | 1,738 | 25,256 | 375 | 20 | -- | -- | 23 |
| Jack pine | 14,588 | 10,518 | 1,223 | 63 | -- | -- | -- | -- |
| White spruce | 2,483 | -- | 193 | 241 | 282 | 652 | 43 | 342 |
| Black spruce | 1,081 | 8 | 12 | 15 | 212 | 5 | 344 | 283 |
| Balsam fir | 1,591 | 6 | 30 | 71 | 470 | 121 | 39 | -1,459 |
| Hemlock | 1,360 | -- | 134 | -- | -- | -- | -- | 146 |
| Tamarack | -1,568 | -1 | -- | -- | -5 | -- | 1 | -1,717 |
| Northern white-cedar | 14,711 | -- | 18 | 29 | 205 | 70 | 215 | 8,741 |
| Other softwoods | 2,584 | -- | 101 | 436 | -- | -- | -- | 179 |
| Total | 76,398 | 12,506 | 27,631 | 3,076 | 1,287 | 858 | 692 | 6,862 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 5,645 | 53 | 192 | 57 | -- | -- | -- | -- |
| Select red oaks | 21,281 | 919 | 238 | 140 | -- | -- | -- | -- |
| Other red oaks | 4,565 | 420 | 199 | -- | -- | -- | -- | -- |
| Hickory | 50 | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 799 | -- | -- | 8 | -- | -- | -- | 7 |
| Hard maple | 23,690 | 4 | 37 | -- | 5 | -- | -- | 9 |
| Soft maple | 42,752 | 135 | 245 | 351 | 188 | 10 | 90 | 583 |
| Beech | 1,378 | -- | 3 | -- | -- | -- | -- | -- |
| Ash | 13,059 | -- | -20 | -- | 9 | -- | -- | 201 |
| Balsam poplar | 1,226 | -- | -- | -- | 10 | -1 | 26 | -140 |
| Cottonwood | 322 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 28,441 | 66 | 436 | 186 | 2 | 2 | -- | -60 |
| Quaking aspen | 20,759 | 227 | 284 | 99 | 152 | 147 | 21 | 122 |
| Basswood | 9,876 | 11 | 20 | -- | -- | -- | -- | 15 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 3 | -- | 3 | -- | -- | -- | -- | -- |
| Black cherry | 5,876 | 16 | 98 | 14 | 27 | -- | 6 | 14 |
| Butternut | 7 | -- | -- | -- | -- | -- | -- | -- |
| Elm | -2,502 | -18 | -- | -7 | -- | -- | -- | -381 |
| Paper birch | 9,155 | 124 | 18 | 42 | 146 | 4 | 14 | 397 |
| Other hardwoods | 267 | -- | -- | -- | -- | -- | -- | -7 |
| Total | 186,649 | 1,957 | 1,753 | 890 | 539 | 162 | 157 | 760 |
| All species | 263,047 | 14,463 | 29,384 | 3,966 | 1,826 | 1,020 | 849 | 7,622 |

(Table 48 continued on next page)

(Table 48 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 24 | 680 | 312 | 1,586 | 1,453 | 62 | 8 | -- |
| Red pine | -- | 1,710 | 34 | 1,089 | 1,593 | 57 | 302 | 12 |
| Jack pine | 110 | 1,862 | -- | 277 | 451 | -- | 14 | 70 |
| White spruce | -- | -- | 56 | 40 | 584 | 50 | -- | -- |
| Black spruce | 25 | 1 | 26 | 4 | 5 | 141 | -- | -- |
| Balsam fir | 20 | 82 | 107 | 262 | 1,603 | 229 | -- | 10 |
| Hemlock | -- | 11 | 64 | 904 | 73 | 28 | -- | -- |
| Tamarack | 178 | -- | -2 | -17 | -1 | -4 | -- | -- |
| Northern white-cedar | 40 | 8 | 1,411 | 968 | 2,663 | 339 | 4 | -- |
| Other softwoods | -- | 4 | -- | 1 | 9 | -- | 1,854 | -- |
| Total | 397 | 4,358 | 2,008 | 5,114 | 8,433 | 902 | 2,182 | 92 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 4,590 | 88 | 307 | 347 | 11 | -- | -- |
| Select red oaks | -- | 14,087 | 108 | 2,352 | 3,342 | 72 | 20 | 3 |
| Other red oaks | -- | 3,693 | 14 | 94 | 145 | -- | -- | -- |
| Hickory | -- | -- | -- | 46 | -- | 4 | -- | -- |
| Yellow birch | -- | 15 | 225 | 338 | 29 | 176 | 1 | -- |
| Hard maple | -- | 91 | 109 | 22,231 | 1,133 | 60 | 11 | -- |
| Soft maple | 3 | 4,918 | 6,402 | 17,130 | 11,885 | 787 | 14 | 11 |
| Beech | -- | 173 | 6 | 1,087 | 100 | 9 | -- | -- |
| Ash | 11 | 482 | 3,347 | 6,136 | 2,531 | 329 | 3 | 30 |
| Balsam poplar | 3 | 10 | 31 | 62 | 1,193 | 23 | 9 | -- |
| Cottonwood | -- | -- | 184 | 60 | 78 | -- | -- | -- |
| Bigtooth aspen | -- | 4,015 | 155 | 3,061 | 20,488 | 90 | -- | -- |
| Quaking aspen | 4 | 634 | 519 | 2,559 | 15,615 | 361 | 15 | -- |
| Basswood | -- | 219 | 293 | 8,831 | 398 | 75 | 14 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 306 | 311 | 3,809 | 1,222 | 11 | 18 | 24 |
| Butternut | -- | 3 | -- | 4 | -- | -- | -- | -- |
| Elm | -- | -15 | -267 | -1,662 | -199 | 59 | -12 | -- |
| Paper birch | 11 | 268 | 567 | 2,021 | 3,794 | 1,749 | -- | -- |
| Other hardwoods | -- | 20 | 85 | 78 | 87 | 4 | -- | -- |
| Total | 32 | 33,509 | 12,177 | 68,544 | 62,188 | 3,820 | 93 | 68 |
| All species | 429 | 37,867 | 14,185 | 73,658 | 70,621 | 4,722 | 2,275 | 160 |

Table 49.--Net annual growth of sawtimber on commercial forest land by species group and forest type, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| | | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All types | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 39,030 | 923 | 1,910 | 10,253 | 1,847 | 58 | 249 | 2,142 |
| Red pine | 73,439 | 7,356 | 45,115 | 1,609 | 226 | -- | -- | 99 |
| Jack pine | 56,093 | 41,938 | 4,571 | 799 | -- | -- | -- | -- |
| White spruce | 7,748 | -- | 143 | 1,014 | 488 | 949 | 58 | 931 |
| Black spruce | -55 | -11 | -- | 21 | 45 | -- | 524 | -759 |
| Balsam fir | 7,348 | -- | -- | 201 | 1,585 | 643 | 11 | -3,899 |
| Hemlock | 5,597 | -- | 49 | -- | -- | -- | -- | 321 |
| Tamarack | -1,882 | -- | -- | -- | -- | -- | 11 | -1,989 |
| Northern white-cedar | 32,964 | -- | 10 | 28 | 236 | 93 | 86 | 20,717 |
| Other softwoods | 4,288 | -- | 628 | 777 | -- | -- | -- | -- |
| Total | 224,570 | 50,206 | 52,426 | 14,702 | 4,427 | 1,743 | 939 | 17,563 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 25,985 | 153 | 147 | 303 | -- | -- | -- | -- |
| Select red oaks | 113,864 | 4,341 | 731 | 1,860 | -- | -- | -- | -- |
| Other red oaks | 17,573 | 616 | 539 | -- | -- | -- | -- | -- |
| Hickory | 128 | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 3,846 | -- | -- | 23 | -- | -- | -- | 831 |
| Hard maple | 69,970 | -- | 267 | -- | -- | -- | -- | 12 |
| Soft maple | 109,124 | 80 | 518 | 61 | 163 | -- | -- | 1,685 |
| Beech | 2,969 | -- | 24 | -- | -- | -- | -- | -- |
| Ash | 38,964 | -- | -127 | -- | -- | -- | -- | 20 |
| Balsam poplar | 10,606 | -- | -- | -- | -9 | -42 | -- | -915 |
| Cottonwood | 1,025 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 111,076 | 946 | 932 | 124 | 15 | 13 | -- | -86 |
| Quaking aspen | 90,673 | 1,052 | 2 | 83 | 1,053 | -- | 635 | -111 |
| Basswood | 50,875 | 21 | 60 | -- | -- | -- | -- | 44 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 12,076 | -- | 179 | -- | -- | -- | -- | -- |
| Butternut | 43 | -- | -- | -- | -- | -- | -- | -- |
| Elm | -1,315 | -- | -- | -- | -- | -- | -- | -795 |
| Paper birch | 19,022 | -- | 31 | 32 | 1,016 | -- | 957 | 1,872 |
| Other hardwoods | 2,273 | -- | -- | -- | -- | -- | -- | -28 |
| Total | 678,777 | 7,209 | 3,303 | 2,486 | 2,238 | -29 | 1,592 | 2,529 |
| All species | 903,347 | 57,415 | 55,729 | 17,188 | 6,665 | 1,714 | 2,531 | 20,092 |

(Table 49 continued on next page)

[1] International 1/4-inch rule.

(Table 49 continued)

| Species group | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 92 | 4,021 | 2,125 | 7,374 | 7,768 | 225 | 43 | -- |
| Red pine | -- | 6,369 | 121 | 2,272 | 10,067 | 130 | -- | 75 |
| Jack pine | 82 | 5,386 | 0 | 654 | 2,590 | -- | 49 | 24 |
| White spruce | -- | -- | 228 | 131 | 3,747 | 59 | -- | -- |
| Black spruce | 102 | -- | 2 | -- | 21 | -- | -- | -- |
| Balsam fir | -- | 42 | 107 | 204 | 7,773 | 681 | -- | -- |
| Hemlock | -- | 44 | 154 | 4,206 | 758 | 65 | -- | -- |
| Tamarack | 68 | -- | 7 | 2 | 24 | -5 | -- | -- |
| Northern white-cedar | 61 | 28 | 2,863 | 1,010 | 5,903 | 1,929 | -- | -- |
| Other softwoods | -- | 19 | -- | 664 | 6 | -- | 2,194 | -- |
| Total | 405 | 15,909 | 5,607 | 16,517 | 38,657 | 3,084 | 2,286 | 99 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 17,946 | 274 | 2,220 | 4,884 | 58 | -- | -- |
| Select red oaks | -- | 70,377 | 269 | 17,970 | 17,247 | 1,010 | 37 | 22 |
| Other red oaks | -- | 13,467 | 18 | 401 | 2,532 | -- | -- | -- |
| Hickory | -- | -- | 0 | 97 | -- | 31 | -- | -- |
| Yellow birch | -- | 16 | 993 | 1,964 | 7 | 4 | 8 | -- |
| Hard maple | -- | 48 | 157 | 66,889 | 1,553 | 1,011 | 33 | -- |
| Soft maple | -- | 8,511 | 33,119 | 49,671 | 13,973 | 1,245 | 42 | 56 |
| Beech | -- | 840 | 27 | 2,037 | 40 | 1 | -- | -- |
| Ash | -- | 3,573 | 8,288 | 24,788 | 2,348 | 54 | 20 | -- |
| Balsam poplar | 1 | 18 | -214 | 55 | 10,500 | 1,212 | -- | -- |
| Cottonwood | -- | -- | 499 | 228 | 298 | -- | -- | -- |
| Bigtooth aspen | -- | 11,481 | 2,003 | 15,107 | 80,436 | 105 | -- | -- |
| Quaking aspen | -- | 1,151 | 5,428 | 22,802 | 58,229 | 349 | -- | -- |
| Basswood | -- | 37 | 2,493 | 44,214 | 2,687 | 1,319 | -- | -- |
| Yellow-poplar | -- | -- | 0 | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | 0 | -- | -- | -- | -- | -- |
| Black cherry | -- | 870 | 1,213 | 7,752 | 2,020 | -- | 42 | -- |
| Butternut | -- | 17 | 0 | 26 | -- | -- | -- | -- |
| Elm | -- | -- | 493 | -781 | -232 | -- | -- | -- |
| Paper birch | 6 | 1,281 | 2,919 | 869 | 7,922 | 2,117 | -- | -- |
| Other hardwoods | -- | 32 | 268 | 264 | 854 | 883 | -- | -- |
| Total | 7 | 129,665 | 58,247 | 256,573 | 205,298 | 9,399 | 182 | 78 |
| All species | 412 | 145,574 | 63,854 | 273,090 | 243,955 | 12,483 | 2,468 | 177 |

Table 50.--Net annual growth of growing stock on commercial forest land by forest type and stand-age class, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 14,463 | 645 | 2,033 | 1,309 | 2,048 | 3,765 | 2,157 | 847 | 1,283 | 223 | 73 | 53 | 27 | -- |
| Red pine | 29,384 | 563 | 3,374 | 14,109 | 6,027 | 2,997 | 323 | 613 | 313 | 515 | 261 | 289 | -- | -- |
| White pine | 3,966 | 36 | 250 | 436 | -- | 496 | 572 | 141 | 413 | 526 | 781 | 76 | 239 | -- |
| Balsam fir | 1,826 | -- | 330 | 132 | -- | 321 | 420 | 304 | 55 | 247 | -- | 52 | -35 | -- |
| White spruce | 1,020 | 159 | 621 | -- | -- | -- | 140 | -- | -- | 157 | -- | -- | -- | -57 |
| Black spruce | 849 | 130 | 38 | -- | -- | 296 | 170 | 5 | 210 | -- | -- | -- | -- | -- |
| Northern white-cedar | 7,622 | 259 | 279 | 134 | 594 | 594 | 1,768 | 1,126 | 1,508 | 510 | 128 | 537 | 151 | 34 |
| Tamarack | 429 | 109 | 35 | 38 | 9 | -- | 105 | 125 | 5 | -- | -- | 3 | -- | -- |
| Oak-hickory | 37,867 | 2,090 | 1,091 | 516 | 2,313 | 5,356 | 9,977 | 5,328 | 2,822 | 2,297 | 2,372 | 2,908 | 751 | 46 |
| Elm-ash-soft maple | 14,185 | 1,263 | 1,047 | 398 | 1,646 | 1,943 | 1,509 | 2,090 | 1,098 | 802 | 523 | 1,412 | 454 | -- |
| Maple-birch | 73,658 | 3,057 | 3,421 | 1,811 | 5,875 | 15,725 | 18,150 | 8,408 | 4,949 | 5,537 | 3,153 | 2,904 | 668 | -- |
| Aspen | 70,621 | 7,881 | 9,852 | 3,181 | 8,333 | 12,589 | 12,376 | 6,014 | 4,881 | 2,350 | 1,558 | 1,338 | 268 | -- |
| Paper birch | 4,722 | 126 | 101 | 312 | 391 | 679 | 1,543 | 1,005 | 253 | 1 | 311 | -- | -- | -- |
| Exotic | 2,275 | 20 | 583 | 1,306 | 250 | 61 | 55 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 160 | 9 | 24 | 22 | -- | 26 | 74 | -- | -- | 5 | -- | -- | -- | -- |
| All types | 263,047 | 16,347 | 23,079 | 23,704 | 27,486 | 44,848 | 49,339 | 26,006 | 17,790 | 13,170 | 9,160 | 9,572 | 2,523 | 23 |

Table 51.--Net annual growth of sawtimber on commercial forest land by forest type and stand-age class, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 57,415 | 1,123 | 2,353 | 1,905 | 14,430 | 16,142 | 9,234 | 3,386 | 6,982 | 435 | 1,208 | 159 | 58 | -- |
| Red pine | 55,729 | 127 | 2,988 | 10,903 | 22,752 | 8,878 | 1,380 | 2,339 | 1,731 | 2,439 | 1,322 | 870 | -- | -- |
| White pine | 17,188 | 82 | 1,531 | 777 | -- | 1,429 | 2,395 | 265 | 2,559 | 2,576 | 3,962 | 372 | 1,240 | -- |
| Balsam fir | 6,665 | -- | 1,034 | 98 | -- | 931 | 274 | 707 | 49 | 2,786 | -- | 130 | 656 | -- |
| White spruce | 1,714 | -- | 964 | -- | -- | -- | 32 | -- | -- | 994 | -- | -- | -- | -276 |
| Black spruce | 2,531 | 958 | 706 | -- | -- | 357 | 466 | -- | 44 | -- | -- | -- | -- | -- |
| Northern white-cedar | 20,092 | 25 | 90 | 537 | 728 | 233 | 4,410 | 1,873 | 2,313 | 611 | 1,206 | 2,922 | 2,815 | 2,329 |
| Tamarack | 412 | -- | 48 | 135 | -- | -- | 3 | 147 | 53 | -- | -- | 26 | -- | -- |
| Oak-hickory | 145,574 | 5,754 | 3,657 | 913 | 5,280 | 13,251 | 32,184 | 21,061 | 13,452 | 17,572 | 8,919 | 20,452 | 2,902 | 177 |
| Elm-ash-soft maple | 63,854 | 8,334 | 3,585 | 1,624 | 5,157 | 8,449 | 9,075 | 7,347 | 7,194 | 6,537 | 1,084 | 4,477 | 991 | -- |
| Maple-birch | 273,090 | 8,658 | 7,439 | 3,283 | 13,860 | 47,621 | 49,869 | 38,782 | 26,767 | 40,880 | 15,171 | 17,004 | 3,756 | -- |
| Aspen | 243,955 | 18,803 | 13,079 | 8,729 | 13,447 | 36,210 | 47,669 | 39,372 | 29,718 | 15,681 | 11,820 | 8,303 | 1,124 | -- |
| Paper birch | 12,483 | 1,066 | -- | -- | 870 | 392 | 5,384 | 3,843 | 736 | 3 | 189 | -- | -- | -- |
| Exotic | 2,468 | -- | 89 | 37 | 1,603 | 660 | 79 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 177 | -- | -- | -- | -- | 102 | 47 | -- | -- | 28 | -- | -- | -- | -- |
| All types | 903,347 | 44,930 | 37,563 | 28,941 | 78,127 | 134,655 | 162,501 | 119,122 | 91,598 | 90,542 | 44,881 | 54,715 | 13,542 | 2,230 |

[1] International 1/4-inch rule.

Table 52.--Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | | |
| Sawtimber | 2,921 | -- | -- | 99 | 128 | 178 | 189 | 991 | 487 | 212 | 227 | 410 | -- | -- | -- |
| Poletimber | 7,848 | -- | -- | 88 | 93 | 552 | 428 | 1,117 | 1,496 | 901 | 1,266 | 1,483 | 424 | -- | -- |
| Sapling & seedling | 3,694 | 18 | 48 | 47 | 458 | 465 | 646 | 589 | 678 | 128 | 130 | -- | 487 | -- | -- |
| All stands | 14,463 | 18 | 48 | 234 | 679 | 1,195 | 1,263 | 2,697 | 2,661 | 1,241 | 1,623 | 1,893 | 911 | -- | -- |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 3,517 | -- | -- | -- | 264 | 210 | -- | 358 | 323 | 233 | 87 | 636 | 428 | 635 | 343 |
| Poletimber | 22,243 | -- | -- | -- | 88 | 184 | 595 | 483 | 1,679 | 2,067 | 1,437 | 2,476 | 4,811 | 4,908 | 3,515 |
| Sapling & seedling | 3,624 | 23 | 3 | 42 | 78 | 172 | 1,147 | 225 | 1,310 | 264 | -- | 300 | 60 | -- | -- |
| All stands | 29,384 | 23 | 3 | 42 | 430 | 566 | 1,742 | 1,066 | 3,312 | 2,564 | 1,524 | 3,412 | 5,299 | 5,543 | 3,858 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 2,739 | -- | -- | -- | 141 | 149 | -- | 268 | 195 | 605 | 216 | 661 | -- | 504 | -- |
| Poletimber | 941 | -- | -- | -- | -- | -- | 94 | 203 | 92 | 318 | -- | 234 | -- | -- | -- |
| Sapling & seedling | 286 | -- | -- | 41 | -- | 95 | 54 | 96 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 3,966 | -- | -- | 41 | 141 | 244 | 148 | 567 | 287 | 923 | 216 | 895 | -- | 504 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | 437 | -- | -- | -- | -- | -- | 130 | -- | -- | -- | 311 | 80 | -- | -84 | -- |
| Poletimber | 927 | -- | -- | -- | -- | 280 | 155 | 42 | 96 | -- | -- | 97 | 257 | -- | -- |
| Sapling & seedling | 462 | -- | 15 | -- | -- | 146 | -- | -- | 174 | 127 | -- | -- | -- | -- | -- |
| All stands | 1,826 | -- | 15 | -- | -- | 426 | 285 | 42 | 270 | 127 | 311 | 177 | 257 | -84 | -- |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | 36 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 93 | -57 | -- | -- | -- |
| Poletimber | 204 | -- | -- | -- | -- | -- | -- | -- | -- | 140 | -- | 64 | -- | -- | -- |
| Sapling & seedling | 780 | -- | -- | -- | 159 | -- | -- | -- | 131 | -- | -- | 490 | -- | -- | -- |
| All stands | 1,020 | -- | -- | -- | 159 | -- | -- | -- | 131 | 140 | 93 | 497 | -- | -- | -- |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 676 | -- | -- | 25 | -- | -- | -- | 150 | -- | 71 | 146 | 75 | -- | 209 | -- |
| Sapling & seedling | 173 | 8 | 130 | -- | 14 | -- | -- | 16 | -- | -- | -- | -- | 5 | -- | -- |
| All stands | 849 | 8 | 130 | 25 | 14 | -- | -- | 166 | -- | 71 | 146 | 75 | 5 | 209 | -- |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | -98 | -- | -- | -- | -- | -- | -- | 40 | -- | -- | 193 | 188 | 297 | 326 | -1,142 |
| Poletimber | 6,735 | -- | -- | -- | 148 | -- | 250 | 65 | 176 | 148 | 71 | 829 | 2,253 | 1,720 | 1,075 |
| Sapling & seedling | 985 | -- | 6 | -- | -- | 3 | -- | 32 | 76 | -- | 179 | 238 | 299 | 152 | -- |
| All stands | 7,622 | -- | 6 | -- | 148 | 3 | 250 | 137 | 252 | 148 | 443 | 1,255 | 2,849 | 2,198 | -67 |

(Table 52 continued on next page)

(Table 52 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 133 | -- | -- | 5 | 3 | -- | -- | -- | 125 | -- | -- | -- | -- | -- | -- |
| Poletimber | 140 | -- | -- | -- | -- | -- | -- | -14 | -- | 35 | -- | 119 | -- | -- | -- |
| Sapling & seedling | 156 | -- | -- | 107 | -- | -- | -- | 32 | 17 | -- | -- | -- | -- | -- | -- |
| All stands | 429 | -- | -- | 112 | 3 | -- | -- | 18 | 142 | 35 | -- | 119 | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 10,543 | 6 | -- | 25 | 108 | 531 | 562 | 1,066 | 1,672 | 1,282 | 1,804 | 2,326 | 884 | 277 | -- |
| Poletimber | 23,819 | -- | 10 | -- | 100 | 1,308 | 1,907 | 2,686 | 2,750 | 2,960 | 3,958 | 4,631 | 2,376 | 1,044 | 89 |
| Sapling & seedling | 3,505 | 37 | 414 | 226 | 668 | 781 | 797 | 468 | 45 | 19 | 50 | -- | -- | -- | -- |
| All stands | 37,867 | 43 | 424 | 251 | 876 | 2,620 | 3,266 | 4,220 | 4,467 | 4,261 | 5,812 | 6,957 | 3,260 | 1,321 | 89 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 5,155 | -- | -- | 53 | 165 | 236 | 296 | 412 | 431 | 33 | 433 | 1,229 | 1,146 | 375 | 346 |
| Poletimber | 6,319 | -- | 24 | 23 | 183 | 347 | 163 | 267 | 649 | 378 | 1,650 | 1,072 | 966 | 434 | 163 |
| Sapling & seedling | 2,711 | 9 | 101 | 261 | 311 | 971 | 524 | 34 | 187 | -- | 192 | 121 | -- | -- | -- |
| All stands | 14,185 | 9 | 125 | 337 | 659 | 1,554 | 983 | 713 | 1,267 | 411 | 2,275 | 2,422 | 2,112 | 809 | 509 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 19,262 | -- | 21 | -- | 99 | 432 | 413 | 885 | 2,177 | 1,422 | 2,860 | 5,230 | 4,178 | 982 | 563 |
| Poletimber | 47,180 | -- | 39 | 70 | 798 | 787 | 1,198 | 2,910 | 5,323 | 3,804 | 5,499 | 12,560 | 10,097 | 3,832 | 263 |
| Sapling & seedling | 7,216 | 53 | 277 | 294 | 1,597 | 997 | 1,342 | 1,733 | 598 | 69 | 235 | 21 | -- | -- | -- |
| All stands | 73,658 | 53 | 337 | 364 | 2,494 | 2,216 | 2,953 | 5,528 | 8,098 | 5,295 | 8,594 | 17,811 | 14,275 | 4,814 | 826 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 14,037 | -- | -- | 17 | 278 | 525 | 269 | 889 | 1,813 | 900 | 1,817 | 2,757 | 2,701 | 1,182 | 889 |
| Poletimber | 37,120 | -- | -- | 59 | 403 | 2,051 | 2,254 | 4,586 | 4,463 | 3,779 | 6,764 | 4,808 | 5,673 | 2,151 | 129 |
| Sapling & seedling | 19,464 | 112 | 809 | 1,360 | 2,408 | 3,696 | 2,153 | 3,898 | 1,263 | 615 | 1,534 | 359 | 1,257 | -- | -- |
| All stands | 70,621 | 112 | 809 | 1,436 | 3,089 | 6,272 | 4,676 | 9,373 | 7,539 | 5,294 | 10,115 | 7,924 | 9,631 | 3,333 | 1,018 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 347 | -- | -- | -- | -- | -- | 37 | -- | -- | -- | 310 | -- | -- | -- | -- |
| Poletimber | 3,836 | -- | -- | -- | 149 | 55 | 120 | 403 | 241 | 291 | 419 | 655 | 1,065 | 438 | -- |
| Sapling & seedling | 539 | -- | 6 | -- | 28 | 67 | 54 | 72 | -- | -- | 312 | -- | -- | -- | -- |
| All stands | 4,722 | -- | 6 | -- | 177 | 122 | 211 | 475 | 241 | 291 | 1,041 | 655 | 1,065 | 438 | -- |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,529 | -- | -- | -- | -- | -- | -- | -- | 55 | 197 | 401 | 670 | 84 | 122 | -- |
| Sapling & seedling | 746 | -- | 20 | 202 | 114 | 13 | -- | -- | 219 | -- | 165 | -- | 13 | -- | -- |
| All stands | 2,275 | -- | 20 | 202 | 114 | 13 | -- | -- | 274 | 197 | 566 | 670 | 97 | 122 | -- |
| Nonstocked | 160 | 19 | 117 | -- | -- | -- | -- | 24 | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 59,029 | 6 | 21 | 199 | 1,186 | 2,261 | 1,896 | 4,909 | 7,223 | 4,687 | 8,351 | 13,460 | 9,634 | 4,197 | 999 |
| Poletimber | 159,517 | -- | 73 | 265 | 1,962 | 5,564 | 7,164 | 12,898 | 17,020 | 15,089 | 21,611 | 29,773 | 28,006 | 14,858 | 5,234 |
| Sapling & seedling | 44,341 | 260 | 1,829 | 2,580 | 5,835 | 7,406 | 6,717 | 7,195 | 4,698 | 1,222 | 2,797 | 1,529 | 2,121 | 152 | 0 |
| Nonstocked | 160 | 19 | 117 | -- | -- | -- | -- | 24 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 263,047 | 285 | 2,040 | 3,044 | 8,983 | 15,231 | 15,777 | 25,026 | 28,941 | 20,998 | 32,759 | 44,762 | 39,761 | 19,207 | 6,233 |

Table 53.--Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1/]

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 18,986 | -- | -- | 359 | 391 | 601 | 375 | 6,863 | 4,580 | 1,220 | 2,482 | 2,115 | -- | -- | -- |
| Poletimber | 33,648 | -- | -- | 138 | 196 | 8,576 | 617 | 5,115 | 6,315 | 1,042 | 8,076 | 1,747 | 1,826 | -- | -- |
| Sapling & seedling | 4,781 | 38 | 82 | 85 | 864 | 2,222 | 362 | 982 | 81 | 65 | -- | -- | -- | -- | -- |
| All stands | 57,415 | 38 | 82 | 582 | 1,451 | 11,399 | 1,354 | 12,960 | 10,976 | 2,327 | 10,558 | 3,862 | 1,826 | -- | -- |
| Red pine | | | | | | | | | | | | | | |
| Sawtimber | 17,239 | -- | -- | -- | 1,642 | 1,077 | -- | 1,176 | 1,341 | 1,293 | 779 | 4,052 | 1,430 | 2,462 | 1,987 |
| Poletimber | 35,956 | -- | -- | -- | 244 | 142 | 706 | 220 | 3,968 | 1,421 | 93 | 3,416 | 7,027 | 10,612 | 8,107 |
| Sapling & seedling | 2,534 | 127 | 19 | -- | -- | 92 | 1,755 | 231 | -- | 310 | -- | -- | -- | -- | -- |
| All stands | 55,729 | 127 | 19 | -- | 1,886 | 1,311 | 2,461 | 1,627 | 5,309 | 3,024 | 872 | 7,468 | 8,457 | 13,074 | 10,094 |
| White pine | | | | | | | | | | | | | | |
| Sawtimber | 13,546 | -- | -- | -- | 265 | 884 | -- | 1,411 | 1,002 | 3,614 | 1,067 | 3,482 | -- | 1,821 | -- |
| Poletimber | 2,030 | -- | -- | -- | -- | -- | 176 | -- | 191 | 886 | -- | 777 | -- | -- | -- |
| Sapling & seedling | 1,612 | -- | -- | 180 | -- | 155 | 315 | 962 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 17,188 | -- | -- | 180 | 265 | 1,039 | 491 | 2,373 | 1,193 | 4,500 | 1,067 | 4,259 | -- | 1,821 | -- |
| Balsam fir | | | | | | | | | | | | | | |
| Sawtimber | 4,119 | -- | -- | -- | -- | -- | 379 | -- | -- | -- | 666 | 2,578 | -- | 496 | -- |
| Poletimber | 1,415 | -- | -- | -- | -- | 114 | 70 | 35 | 126 | -- | -- | 88 | 982 | -- | -- |
| Sapling & seedling | 1,131 | -- | -- | -- | -- | 801 | -- | -- | 98 | 232 | -- | -- | -- | -- | -- |
| All stands | 6,665 | -- | -- | -- | -- | 915 | 449 | 35 | 224 | 232 | 666 | 2,666 | 982 | 496 | -- |
| White spruce | | | | | | | | | | | | | | |
| Sawtimber | -188 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 88 | -276 | -- | -- | -- |
| Poletimber | 938 | -- | -- | -- | -- | -- | -- | -- | -- | 32 | -- | 906 | -- | -- | -- |
| Sapling & seedling | 964 | -- | -- | -- | -- | -- | -- | -- | 964 | -- | -- | -- | -- | -- | -- |
| All stands | 1,714 | -- | -- | -- | -- | -- | -- | -- | 964 | 32 | 88 | 630 | -- | -- | -- |
| Black spruce | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 867 | -- | -- | 466 | -- | -- | -- | 225 | -- | 75 | -- | 57 | -- | 44 | -- |
| Sapling & seedling | 1,664 | -- | 983 | -- | 654 | -- | -- | 27 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,531 | -- | 983 | 466 | 654 | -- | -- | 252 | -- | 75 | -- | 57 | -- | 44 | -- |
| Northern white-cedar | | | | | | | | | | | | | | |
| Sawtimber | 8,745 | -- | -- | -- | -- | -- | -- | 90 | -- | -- | 1,580 | 3,315 | 1,998 | 3,394 | -1,632 |
| Poletimber | 10,558 | -- | -- | -- | 20 | -- | 46 | 813 | 724 | 785 | 41 | 1,183 | 3,631 | 2,702 | 613 |
| Sapling & seedling | 789 | -- | 29 | -- | -- | -- | -- | 12 | 73 | -- | 353 | 13 | 309 | -- | -- |
| All stands | 20,092 | -- | 29 | -- | 20 | -- | 46 | 915 | 797 | 785 | 1,974 | 4,511 | 5,938 | 6,096 | -1,019 |

(Table 53 continued on next page)

(Table 53 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 225 | -- | -- | 53 | 26 | -- | -- | -- | 146 | -- | -- | -- | -- | -- | -- |
| Poletimber | 51 | -- | -- | -- | -- | -- | -- | -- | -- | 48 | -- | 3 | -- | -- | -- |
| Sapling & seedling | 136 | -- | -- | -- | -- | -- | -- | 139 | -3 | -- | -- | -- | -- | -- | -- |
| All stands | 412 | -- | -- | 53 | 26 | -- | -- | 139 | 143 | 48 | -- | 3 | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 60,771 | 32 | -- | 738 | 506 | 1,641 | 3,245 | 6,230 | 8,352 | 14,445 | 8,808 | 7,904 | 8,058 | 812 | -- |
| Poletimber | 75,352 | -- | 16 | -- | 25 | 2,243 | 4,432 | 6,319 | 10,077 | 8,579 | 12,564 | 17,435 | 9,862 | 3,785 | 15 |
| Sapling & seedling | 9,451 | 127 | 897 | 306 | 1,395 | 2,797 | 1,734 | 1,793 | 148 | 32 | 222 | -- | -- | -- | -- |
| All stands | 145,574 | 159 | 913 | 1,044 | 1,926 | 6,681 | 9,411 | 14,342 | 18,577 | 23,056 | 21,594 | 25,339 | 17,920 | 4,597 | 15 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 30,352 | -- | -- | 134 | 394 | 3,071 | 3,389 | 2,027 | 900 | 100 | 3,744 | 8,647 | 6,857 | 1,029 | 60 |
| Poletimber | 19,916 | -- | 51 | 71 | 19 | 502 | 995 | 1,111 | 1,601 | 1,370 | 3,514 | 4,371 | 3,103 | 2,326 | 882 |
| Sapling & seedling | 13,586 | 21 | 141 | 792 | 1,962 | 4,894 | 3,567 | -28 | 2,129 | -- | 71 | 37 | -- | -- | -- |
| All stands | 63,854 | 21 | 192 | 997 | 2,375 | 8,467 | 7,951 | 3,110 | 4,630 | 1,470 | 7,329 | 13,055 | 9,960 | 3,355 | 942 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 121,505 | -- | 102 | -- | 297 | 1,572 | 3,059 | 6,441 | 12,020 | 5,879 | 17,873 | 32,471 | 29,898 | 10,089 | 1,804 |
| Poletimber | 133,351 | -- | -- | 50 | 1,064 | 2,976 | 4,425 | 10,965 | 5,244 | 9,512 | 8,890 | 40,595 | 31,745 | 16,641 | 1,244 |
| Sapling & seedling | 18,234 | 114 | 356 | 2,490 | 3,073 | 2,862 | 4,545 | 2,278 | 1,202 | 182 | 1,118 | 14 | -- | -- | -- |
| All stands | 273,090 | 114 | 458 | 2,540 | 4,434 | 7,410 | 12,029 | 19,684 | 18,466 | 15,573 | 27,881 | 73,080 | 61,643 | 26,730 | 3,048 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 98,434 | -- | -- | 23 | 704 | 2,038 | 2,389 | 10,306 | 13,918 | 8,824 | 14,166 | 14,880 | 18,003 | 6,967 | 6,216 |
| Poletimber | 107,465 | -- | -- | 39 | 3,811 | 2,655 | 2,273 | 10,085 | 8,381 | 9,077 | 15,382 | 14,307 | 30,205 | 6,853 | 4,397 |
| Sapling & seedling | 38,056 | 278 | 3,026 | 2,493 | 4,411 | 9,598 | 5,012 | 6,847 | 4,631 | 480 | 691 | 251 | 338 | -- | -- |
| All stands | 243,955 | 278 | 3,026 | 2,555 | 8,926 | 14,291 | 9,674 | 27,238 | 26,930 | 18,381 | 30,239 | 29,438 | 48,546 | 13,820 | 10,613 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 270 | -- | -- | -- | -- | -- | 81 | -- | -- | -- | 189 | -- | -- | -- | -- |
| Poletimber | 11,146 | -- | -- | -- | 94 | 80 | 28 | 1,320 | 153 | 92 | 337 | 1,744 | 3,964 | 3,334 | -- |
| Sapling & seedling | 1,067 | -- | -- | -- | -- | -- | 54 | 1,013 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 12,483 | -- | -- | -- | 94 | 80 | 163 | 2,333 | 153 | 92 | 526 | 1,744 | 3,964 | 3,334 | -- |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2,342 | -- | -- | -- | -- | -- | -- | -- | 79 | -- | 57 | 1,487 | -- | 719 | -- |
| Sapling & seedling | 126 | -- | -- | -- | -- | -- | -- | -- | 80 | -- | 46 | -- | -- | -- | -- |
| All stands | 2,468 | -- | -- | -- | -- | -- | -- | -- | 159 | -- | 103 | 1,487 | -- | 719 | -- |
| Nonstocked | 177 | -- | 177 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 374,004 | 32 | 102 | 1,307 | 4,225 | 10,884 | 12,917 | 34,544 | 42,259 | 35,375 | 51,442 | 79,168 | 66,244 | 27,070 | 8,435 |
| Poletimber | 435,035 | -- | 67 | 764 | 5,473 | 17,288 | 13,768 | 36,208 | 36,859 | 32,919 | 48,954 | 88,116 | 92,345 | 47,016 | 15,258 |
| Spling & seedling | 94,131 | 705 | 5,533 | 6,346 | 12,359 | 23,421 | 17,344 | 14,256 | 9,403 | 1,301 | 2,501 | 315 | 647 | -- | -- |
| Nonstocked | 177 | -- | 177 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 903,347 | 737 | 5,879 | 8,417 | 22,057 | 51,593 | 44,029 | 85,008 | 88,521 | 69,595 | 102,897 | 167,599 | 159,236 | 74,086 | 23,693 |

[1] International 1/4-inch rule.

Table 54.--Timber removals[1] from growing stock on commercial forest land by species group and county, Northern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 872 | 107 | 5 | 3 | 6 | 11 | 3 | 5 | 24 | 7 | 123 | 3 |
| Red pine | 3,105 | 118 | 14 | 17 | 4 | 9 | 5 | 9 | 66 | 18 | 146 | 11 |
| Jack pine | 7,999 | 192 | 169 | 8 | 9 | -- | -- | -- | 377 | 188 | 1,014 | 1 |
| White spruce | 87 | 5 | 38 | -- | -- | -- | -- | 3 | 18 | -- | -- | 1 |
| Black spruce | 88 | 4 | 1 | 3 | -- | -- | 1 | 3 | 12 | -- | 3 | 4 |
| Balsam fir | 842 | 12 | 175 | 3 | 2 | -- | -- | 5 | 136 | 4 | 3 | 6 |
| Hemlock | 185 | 3 | 1 | 25 | -- | -- | 5 | 22 | 6 | -- | 1 | 10 |
| Tamarack | 438 | 2 | 16 | 5 | 6 | -- | 22 | 14 | 45 | 26 | 6 | 35 |
| Northern white-cedar | 1,633 | 32 | 290 | 14 | 3 | -- | 5 | 62 | 212 | 21 | 9 | 32 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 15,249 | 475 | 709 | 78 | 30 | 20 | 41 | 123 | 896 | 264 | 1,305 | 103 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 3,006 | 123 | 22 | 2 | 16 | 13 | 8 | 1 | 3 | 242 | 67 | 3 |
| Select red oaks | 11,720 | 781 | 219 | 145 | 146 | 40 | 45 | 8 | 69 | 406 | 676 | 16 |
| Other red oaks | 3,541 | 175 | -- | -- | 36 | -- | -- | -- | 8 | 151 | 117 | -- |
| Hickory | 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 40 | -- | -- | 1 | -- | -- | 1 | 8 | 15 | -- | -- | 2 |
| Hard maple | 5,310 | 40 | 48 | 442 | 19 | 10 | 251 | 370 | 348 | 104 | 66 | 413 |
| Soft maple | 8,839 | 287 | 505 | 86 | 139 | 32 | 183 | 90 | 507 | 422 | 138 | 126 |
| Beech | 1,539 | 30 | 8 | 63 | 2 | -- | 69 | 74 | 118 | 28 | 39 | 197 |
| Ash | 2,090 | 70 | 77 | 190 | 36 | 7 | 44 | 50 | 156 | 46 | 99 | 94 |
| Balsam poplar | 784 | 134 | 74 | 4 | 5 | 1 | -- | 5 | 150 | 4 | 2 | 18 |
| Cottonwood | 454 | -- | -- | -- | 53 | 2 | -- | -- | -- | 21 | 9 | -- |
| Bigtooth aspen | 25,206 | 2,051 | 802 | 274 | 304 | 22 | 306 | 182 | 1,824 | 2,160 | 1,029 | 424 |
| Quaking aspen | 20,023 | 1,900 | 546 | 85 | 244 | 7 | 286 | 205 | 1,979 | 1,406 | 581 | 384 |
| Basswood | 1,980 | 22 | 8 | 173 | 3 | 1 | 109 | 105 | 244 | 33 | 29 | 203 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,731 | 29 | 79 | 207 | 15 | 4 | 50 | 77 | 104 | 3 | 38 | 62 |
| Paper birch | 2,579 | 233 | 110 | 28 | 19 | 4 | 41 | 39 | 253 | 99 | 65 | 44 |
| Other hardwoods[2] | 418 | 11 | -- | 5 | 2 | -- | 45 | 3 | 2 | 24 | 11 | 13 |
| Total | 89,275 | 5,886 | 2,498 | 1,705 | 1,039 | 143 | 1,438 | 1,217 | 5,780 | 5,149 | 2,966 | 1,999 |
| All species | 104,524 | 6,361 | 3,207 | 1,783 | 1,069 | 163 | 1,479 | 1,340 | 6,676 | 5,413 | 4,271 | 2,102 |

(Table 54 continued on next page)

[1] Removals in 1979 are trend-level removals.
[2] Includes black cherry.

(Table 54 continued)

| Species group | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 9 | 25 | 62 | 2 | 13 | 10 | 18 | 7 | 3 | 5 | 7 | 12 |
| Red pine | 11 | 8 | 122 | 6 | 42 | 32 | 2 | 94 | 172 | 210 | 6 | 39 |
| Jack pine | 6 | 146 | 749 | -- | 225 | 597 | 10 | 3 | 2 | -- | 50 | 34 |
| White spruce | -- | -- | 2 | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Black spruce | -- | -- | 2 | -- | 3 | -- | 10 | -- | -- | -- | -- | 2 |
| Balsam fir | 4 | -- | 4 | -- | 5 | -- | -- | -- | -- | -- | -- | 3 |
| Hemlock | -- | 3 | 2 | 2 | 5 | 3 | 37 | 2 | 1 | 4 | 1 | 2 |
| Tamarack | -- | 59 | 35 | 5 | 2 | -- | 10 | 16 | -- | -- | -- | 16 |
| Northern white-cedar | 4 | 15 | 27 | 7 | 11 | 18 | 7 | 9 | 5 | 7 | -- | 15 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 34 | 256 | 1,005 | 22 | 306 | 660 | 94 | 131 | 183 | 227 | 64 | 123 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 82 | 17 | 62 | 72 | 52 | 357 | 1 | 82 | 146 | 179 | 180 | 80 |
| Select red oaks | 345 | 32 | 152 | 172 | 293 | 1,113 | 145 | 299 | 332 | 392 | 410 | 136 |
| Other red oaks | 63 | -- | 208 | 22 | -- | 528 | -- | 200 | 276 | 130 | 7 | 2 |
| Hickory | -- | -- | -- | 3 | -- | -- | -- | -- | -- | 3 | 3 | -- |
| Yellow birch | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 36 | 130 | 55 | 151 | 159 | 83 | 311 | 122 | 114 | 212 | 92 | 115 |
| Soft maple | 306 | 89 | 156 | 175 | 169 | 363 | 95 | 411 | 400 | 231 | 510 | 159 |
| Beech | 3 | 17 | 2 | 17 | 40 | 37 | 50 | 43 | 59 | 40 | 32 | 49 |
| Ash | 36 | 25 | 45 | 69 | 108 | 31 | 41 | 47 | 16 | 72 | 106 | 37 |
| Balsam poplar | 18 | 5 | 12 | 4 | -- | 1 | -- | -- | 1 | -- | 7 | 2 |
| Cottonwood | 62 | -- | 48 | 31 | -- | -- | -- | -- | -- | 16 | 191 | -- |
| Bigtooth aspen | 903 | 191 | 391 | 382 | 390 | 792 | 18 | 241 | 630 | 663 | 688 | 480 |
| Quaking aspen | 860 | 167 | 311 | 186 | 342 | 436 | 3 | 396 | 387 | 217 | 335 | 303 |
| Basswood | 19 | 41 | 1 | 48 | 5 | 46 | 63 | 20 | 52 | 44 | 59 | 61 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 35 | 58 | 66 | 2 | 63 | 24 | 72 | 48 | 16 | 29 | 12 | 54 |
| Paper birch | 141 | 22 | 43 | 21 | 50 | 19 | 6 | 25 | 30 | 12 | 92 | 38 |
| Other hardwoods | 3 | 16 | 9 | 1 | 8 | 22 | 13 | 35 | 16 | 12 | 3 | 17 |
| Total | 2,912 | 810 | 1,561 | 1,356 | 1,680 | 3,852 | 818 | 1,969 | 2,475 | 2,252 | 2,727 | 1,533 |
| All species | 2,946 | 1,066 | 2,566 | 1,378 | 1,986 | 4,512 | 912 | 2,100 | 2,658 | 2,479 | 2,791 | 1,656 |

(Table 54 continued on next page)

(Table 54 continued)

| Species group | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | |
| White pine | 19 | 111 | 20 | 29 | 27 | 27 | 15 | 34 | 33 | 87 |
| Red pine | 48 | 448 | 125 | 37 | 266 | 46 | 36 | 58 | 102 | 778 |
| Jack pine | 477 | 3 | 3 | 265 | -- | 994 | 314 | 285 | 1,010 | 868 |
| White spruce | 4 | -- | -- | 1 | 1 | 1 | 1 | 10 | 1 | -- |
| Black spruce | 6 | -- | -- | -- | 1 | -- | 11 | 14 | 3 | 5 |
| Balsam fir | 167 | -- | -- | 3 | 3 | 8 | 8 | 280 | 6 | 5 |
| Hemlock | 1 | 4 | 4 | -- | 18 | 2 | 7 | 7 | 1 | 6 |
| Tamarack | 35 | 14 | 3 | 1 | 6 | 2 | 6 | 29 | 16 | 6 |
| Northern white-cedar | 162 | 7 | 7 | 19 | 23 | 11 | 17 | 518 | 45 | 19 |
| Other softwoods | -- | -- | -- | -- | -- | | -- | -- | -- | -- |
| Total | 919 | 587 | 162 | 355 | 345 | 1,091 | 415 | 1,235 | 1,217 | 1,774 |
| HARDWOODS | | | | | | | | | | |
| Select white oaks | 74 | 435 | 208 | 45 | 174 | 105 | 11 | 16 | 66 | 62 |
| Select red oaks | 593 | 1,114 | 495 | 400 | 968 | 459 | 223 | 34 | 847 | 215 |
| Other red oaks | 5 | 1,002 | 260 | 19 | -- | 200 | 41 | -- | 11 | 80 |
| Hickory | -- | 3 | -- | -- | 3 | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | -- | -- | 1 | -- | 10 | -- | -- | 1 |
| Hard maple | 73 | 223 | 396 | 45 | 242 | 38 | 286 | 144 | 38 | 134 |
| Soft maple | 444 | 429 | 427 | 137 | 493 | 205 | 287 | 171 | 186 | 481 |
| Beech | 50 | 59 | 101 | 12 | 108 | 9 | 102 | 26 | 6 | 49 |
| Ash | 59 | 120 | 59 | 24 | 140 | 34 | 107 | 14 | 4 | 27 |
| Balsam poplar | 114 | 4 | 2 | 14 | 2 | 37 | 15 | 141 | 6 | 2 |
| Cottonwood | -- | 11 | 7 | -- | 3 | -- | -- | -- | -- | |
| Bigtooth aspen | 1,869 | 991 | 842 | 1,176 | 915 | 968 | 864 | 590 | 1,054 | 790 |
| Quaking aspen | 2,109 | 526 | 491 | 521 | 914 | 1,008 | 696 | 983 | 708 | 501 |
| Basswood | 45 | 51 | 126 | 31 | 63 | 19 | 114 | 116 | 4 | 22 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 49 | 15 | 10 | 53 | 21 | 28 | 183 | 81 | 54 | 90 |
| Paper birch | 258 | 13 | 18 | 105 | 49 | 112 | 161 | 333 | 51 | 45 |
| Other hardwoods | 2 | 33 | 16 | 11 | 29 | 10 | 9 | -- | 9 | 28 |
| Total | 5,744 | 5,029 | 3,458 | 2,593 | 4,125 | 3,232 | 3,109 | 2,649 | 3,044 | 2,527 |
| All species | 6,663 | 5,616 | 3,620 | 2,948 | 4,470 | 4,323 | 3,524 | 3,884 | 4,261 | 4,301 |

Table 55.--Timber removals[1] from sawtimber on commercial forest land by species group and county, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[2]

| Species group | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alcona | Alpena | Antrim | Arenac | Bay | Benzie | Charlevoix | Cheboygan | Clare | Crawford | Emmet |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 4,749 | 593 | 24 | 16 | 34 | 65 | 16 | 19 | 115 | 33 | 696 | 17 |
| Red pine | 10,636 | 634 | 56 | 98 | 24 | 57 | 26 | 53 | 245 | 92 | 816 | 64 |
| Jack pine | 20,583 | 431 | 402 | 18 | 37 | 1 | -- | -- | 934 | 597 | 2,567 | 4 |
| White spruce | 316 | 18 | 104 | -- | -- | -- | -- | 14 | 75 | -- | -- | 5 |
| Black spruce | 113 | 3 | 1 | -- | -- | -- | -- | -- | 16 | -- | 2 | 1 |
| Balsam fir | 3,264 | 22 | 617 | 4 | 3 | -- | -- | 7 | 589 | 12 | 8 | 9 |
| Hemlock | 805 | 6 | 2 | 134 | -- | -- | 18 | 119 | 27 | -- | 2 | 48 |
| Tamarack | 185 | 1 | 5 | 2 | 2 | -- | 7 | 5 | 50 | 8 | 2 | 12 |
| Northern white-cedar | 3,627 | 27 | 682 | 8 | 2 | -- | 3 | 54 | 543 | 25 | 5 | 28 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 44,278 | 1,735 | 1,893 | 280 | 102 | 123 | 70 | 271 | 2,594 | 767 | 4,098 | 188 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 9,022 | 290 | 59 | 7 | 81 | 66 | 7 | 1 | 2 | 319 | 93 | 19 |
| Select red oaks | 38,084 | 1,661 | 575 | 753 | 696 | 207 | 75 | 9 | 122 | 1,196 | 2,748 | 68 |
| Other red oaks | 11,073 | 367 | -- | -- | 171 | -- | -- | -- | 14 | 440 | 474 | -- |
| Hickory | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 188 | -- | -- | 1 | -- | -- | 1 | 47 | 80 | -- | -- | 6 |
| Hard maple | 25,517 | 151 | 174 | 2,259 | 98 | 58 | 1,182 | 1,925 | 1,756 | 531 | 294 | 1,987 |
| Soft maple | 26,621 | 707 | 1,553 | 411 | 675 | 152 | 360 | 298 | 1,244 | 1,314 | 343 | 445 |
| Beech | 7,967 | 150 | 30 | 333 | 11 | -- | 352 | 429 | 632 | 93 | 203 | 1,095 |
| Ash | 8,784 | 224 | 145 | 956 | 158 | 27 | 206 | 248 | 564 | 169 | 500 | 475 |
| Balsam poplar | 2,701 | 308 | 208 | 21 | 19 | 4 | -- | 26 | 644 | 16 | 10 | 96 |
| Cottonwood | 2,332 | -- | -- | -- | 269 | 8 | -- | -- | -- | 102 | 65 | -- |
| Bigtooth aspen | 63,600 | 5,243 | 1,816 | 1,013 | 1,183 | 73 | 456 | 435 | 5,273 | 5,362 | 2,990 | 1,298 |
| Quaking aspen | 63,275 | 4,841 | 1,244 | 399 | 1,153 | 29 | 615 | 585 | 7,412 | 4,668 | 2,169 | 1,535 |
| Basswood | 9,760 | 91 | 11 | 883 | 19 | 4 | 527 | 535 | 1,236 | 140 | 141 | 1,057 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 5,975 | 95 | 262 | 803 | 46 | 13 | 163 | 284 | 411 | 9 | 152 | 231 |
| Paper birch | 5,208 | 421 | 140 | 113 | 57 | 1 | 68 | 55 | 602 | 151 | 150 | 105 |
| Other hardwoods[3] | 806 | 13 | 2 | 10 | 3 | -- | 169 | 3 | 10 | 25 | 16 | 19 |
| Total | 281,006 | 14,562 | 6,219 | 7,962 | 4,639 | 642 | 4,181 | 4,880 | 20,002 | 14,535 | 10,348 | 8,436 |
| All species | 325,284 | 16,297 | 8,112 | 8,242 | 4,741 | 765 | 4,251 | 5,151 | 22,596 | 15,302 | 14,446 | 8,624 |

(Table 55 continued on next page)

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[1] Removals in 1979 are trend-level removals.
[2] International 1/4-inch rule.
[3] Includes black cherry.

(Table 55 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Gladwin | Grand Traverse | Iosco | Isabella | Kalkaska | Lake | Leelanau | Manistee | Mason | Mecosta | Midland | Missaukee |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 44 | 138 | 352 | 10 | 72 | 37 | 99 | 31 | 15 | 21 | 30 | 57 |
| Red pine | 66 | 36 | 483 | 28 | 178 | 159 | 12 | 260 | 469 | 556 | 37 | 115 |
| Jack pine | 28 | 314 | 1,658 | 2 | 665 | 1,609 | 23 | 6 | 4 | -- | 242 | 75 |
| White spruce | -- | -- | 10 | -- | -- | -- | -- | -- | -- | 5 | -- | -- |
| Black spruce | -- | -- | -- | -- | 1 | -- | 52 | -- | -- | -- | -- | -- |
| Balsam fir | 17 | -- | 6 | -- | 7 | -- | -- | -- | -- | -- | -- | 6 |
| Hemlock | -- | 8 | 5 | 5 | 20 | 8 | 206 | 5 | 2 | 12 | 2 | 6 |
| Tamarack | -- | 19 | 12 | 2 | 1 | -- | 3 | 5 | -- | -- | -- | 5 |
| Northern white-cedar | 16 | 9 | 16 | 4 | 6 | 10 | 4 | 5 | 3 | 4 | -- | 11 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 171 | 524 | 2,542 | 51 | 950 | 1,823 | 399 | 312 | 493 | 598 | 311 | 275 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 341 | 29 | 179 | 346 | 244 | 1,110 | 3 | 81 | 447 | 820 | 892 | 261 |
| Select red oaks | 1,248 | 76 | 414 | 830 | 1,373 | 2,869 | 742 | 491 | 852 | 1,788 | 2,033 | 457 |
| Other red oaks | 228 | -- | 562 | 106 | -- | 1,354 | -- | 324 | 704 | 593 | 35 | 7 |
| Hickory | -- | -- | -- | 18 | -- | -- | -- | -- | -- | 21 | 18 | -- |
| Yellow birch | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 191 | 553 | 227 | 847 | 730 | 405 | 1,534 | 439 | 587 | 1,099 | 518 | 460 |
| Soft maple | 1,104 | 225 | 645 | 858 | 409 | 900 | 485 | 760 | 1,026 | 1,055 | 2,114 | 432 |
| Beech | 7 | 74 | 10 | 96 | 209 | 193 | 266 | 209 | 309 | 195 | 175 | 236 |
| Ash | 131 | 113 | 174 | 348 | 536 | 91 | 169 | 192 | 36 | 305 | 520 | 161 |
| Balsam poplar | 82 | 26 | 43 | 15 | -- | 5 | -- | -- | 5 | -- | 25 | 10 |
| Cottonwood | 321 | -- | 243 | 157 | -- | -- | -- | -- | -- | 83 | 975 | -- |
| Bigtooth aspen | 2,681 | 358 | 1,400 | 743 | 806 | 1,737 | 59 | 364 | 1362 | 1419 | 2,190 | 1,160 |
| Quaking aspen | 3,227 | 381 | 1,371 | 457 | 957 | 1,189 | 18 | 862 | 1001 | 595 | 1,392 | 951 |
| Basswood | 71 | 197 | 10 | 247 | 10 | 238 | 320 | 76 | 240 | 219 | 293 | 275 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 101 | 184 | 221 | 8 | 200 | 69 | 268 | 154 | 46 | 93 | 33 | 175 |
| Paper birch | 265 | 23 | 122 | 28 | 73 | 26 | 21 | 34 | 43 | 19 | 232 | 50 |
| Other hardwoods | 3 | 65 | 9 | -- | 7 | 45 | 59 | 55 | 30 | 14 | 2 | 44 |
| Total | 10,001 | 2,304 | 5,630 | 5,104 | 5,555 | 10,231 | 3,944 | 4,041 | 6,688 | 8,318 | 11,447 | 4,679 |
| All species | 10,172 | 2,828 | 8,172 | 5,155 | 6,505 | 12,054 | 4,343 | 4,353 | 7,181 | 8,916 | 11,758 | 4,954 |

(Table 55 continued on next page)

(Table 55 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | Montmorency | Newaygo | Oceana | Ogemaw | Osceola | Oscoda | Otsego | Presque Isle | Roscommon | Wexford |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |
| White pine | 108 | 621 | 108 | 168 | 153 | 145 | 57 | 190 | 176 | 489 |
| Red pine | 249 | 1,220 | 348 | 205 | 809 | 238 | 152 | 284 | 561 | 2,006 |
| Jack pine | 1,202 | 6 | 7 | 612 | -- | 2,248 | 738 | 650 | 3,628 | 1,875 |
| White spruce | 23 | -- | -- | 4 | 4 | 5 | 5 | 40 | 4 | -- |
| Black spruce | 4 | ---- | -- | -- | -- | 2 | 7 | 18 | -- | 6 |
| Balsam fir | 757 | -- | -- | 4 | 4 | 16 | 13 | 1138 | 11 | 14 |
| Hemlock | 2 | 10 | 10 | -- | 85 | 3 | 16 | 18 | 6 | 20 |
| Tamarack | 11 | 5 | 1 | 5 | 2 | 1 | 2 | 10 | 5 | 2 |
| Northern white-cedar | 518 | 4 | 11 | 11 | 14 | 7 | 12 | 1544 | 28 | 13 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 2,874 | 1,866 | 485 | 1,009 | 1,071 | 2,665 | 1,002 | 3,892 | 4,419 | 4,425 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 135 | 1187 | 853 | 116 | 719 | 96 | 6 | 67 | 93 | 53 |
| Select red oaks | 986 | 4,157 | 2,076 | 1,266 | 4,115 | 1,229 | 805 | 52 | 1,813 | 302 |
| Other red oaks | 8 | 3,726 | 1,088 | 60 | -- | 531 | 148 | -- | 23 | 110 |
| Hickory | -- | 18 | -- | -- | 18 | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | -- | -- | 1 | -- | 51 | -- | -- | -- |
| Hard maple | 287 | 1,115 | 2,162 | 172 | 1,115 | 138 | 1,308 | 577 | 164 | 474 |
| Soft maple | 987 | 1,741 | 1,853 | 410 | 1,129 | 408 | 739 | 427 | 467 | 945 |
| Beech | 261 | 281 | 541 | 61 | 528 | 37 | 538 | 141 | 29 | 243 |
| Ash | 111 | 519 | 265 | 87 | 606 | 111 | 535 | 20 | 13 | 69 |
| Balsam poplar | 299 | 21 | 10 | 53 | 10 | 77 | 61 | 574 | 23 | 10 |
| Cottonwood | -- | 59 | 34 | -- | 16 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 4,641 | 2,220 | 1,774 | 4,016 | 2,218 | 2,130 | 2,130 | 1,414 | 2,304 | 1,332 |
| Quaking aspen | 6,911 | 1,601 | 1,364 | 2,282 | 2,867 | 2,820 | 2,219 | 3,020 | 2,009 | 1,131 |
| Basswood | 213 | 256 | 618 | 148 | 310 | 89 | 594 | 594 | 15 | 83 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 182 | 46 | 30 | 172 | 73 | 91 | 641 | 264 | 179 | 276 |
| Paper birch | 601 | 21 | 24 | 293 | 84 | 246 | 392 | 590 | 78 | 80 |
| Other hardwoods | 2 | 35 | 16 | 15 | 51 | 15 | 13 | -- | 14 | 42 |
| Total | 15,624 | 17,003 | 12,708 | 9,151 | 13,860 | 8,018 | 10,180 | 7,740 | 7,224 | 5,150 |
| All species | 18,498 | 18,869 | 13,193 | 10,160 | 14,931 | 10,683 | 11,182 | 11,632 | 11,643 | 9,575 |

Table 56.--Timber removals[1] from growing stock and sawtimber on commercial forest land by species group, Northern Lower Peninsula, Michigan, [2]1965 and 1979

| Species group | Growing stock | | Sawtimber | |
|---|---|---|---|---|
| | [2]1965 | 1979 | [2]1965 | 1979 |
| | Thousand cubic feet | | [3]Thousand board feet | |
| SOFTWOODS | | | | |
| White pine | 387 | 872 | 1,964 | 4,749 |
| Red pine | 1,133 | 3,105 | 4,244 | 10,636 |
| Jack pine | 9,574 | 7,999 | 24,592 | 20,583 |
| White spruce | 113 | 87 | 576 | 316 |
| Black spruce | 145 | 88 | 91 | 113 |
| Balsam fir | 415 | 842 | 1,142 | 3,264 |
| Hemlock | 185 | 185 | 821 | 805 |
| Tamarack | 683 | 438 | 278 | 185 |
| Northern white-cedar | 1,976 | 1,633 | 2,064 | 3,627 |
| Other softwoods | -- | -- | -- | -- |
| Total | 14,611 | 15,249 | 35,772 | 44,278 |
| HARDWOODS | | | | |
| Select white oaks | 809 | 3,006 | 3,243 | 9,022 |
| Select red oaks | 6,826 | 11,720 | 22,729 | 38,084 |
| Other red oaks | 1,211 | 3,541 | 4,407 | 11,073 |
| Hickory | [4] | 15 | [4] | 93 |
| Yellow birch | 47 | 40 | 267 | 188 |
| Hard maple | 1,914 | 5,310 | 8,962 | 25,517 |
| Soft maple | 3,082 | 8,839 | 9,848 | 26,621 |
| Beech | 1,421 | 1,539 | 8,142 | 7,967 |
| Ash | 454 | 2,090 | 2,254 | 8,784 |
| Balsam poplar | 273 | 784 | 1,489 | 2,701 |
| Cottonwood | 130 | 454 | 837 | 2,332 |
| Bigtooth aspen | 19,444 | 25,206 | 60,304 | 63,600 |
| Quaking aspen | 19,115 | 20,023 | 59,098 | 63,275 |
| Basswood | 959 | 1,980 | 5,440 | 9,760 |
| Yellow-poplar | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- |
| Elm | 3,514 | 1,731 | 20,143 | 5,975 |
| Paper birch | 3,178 | 2,579 | 7,676 | 5,208 |
| Other hardwoods[5] | 718 | 418 | 3,493 | 806 |
| Total | 63,095 | 89,275 | 218,332 | 281,006 |
| All species | 77,706 | 104,524 | 254,104 | 325,284 |

[1] Removals in 1979 are trend-level removals.

[2] Figures have been adjusted from those published after the 1966 survey to conform 1980 volumes because of changes in survey definitions and procedures.

[3] International 1/4-inch rule.

[4] Included in other hardwoods.

[5] Includes black cherry in 1965 and 1979 and hickory in 1965.

Table 57.--Timber removals[1] from growing stock and sawtimber on commercial forest land by item and species category, Northern Lower Peninsula, Michigan, 1979

| Item | Growing stock | | | | | | Sawtimber | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods |
| | - - - - - - - - - Thousand cubic feet- - - - - - - - - | | | | | | - - - - - - - - - [2]Thousand board feet- - - - - - - - - - | | | | | |
| ROUNDWOOD PRODUCTS | | | | | | | | | | | | |
| Pulpwood | 39,720 | 8,372 | 107 | 18,859 | 197 | 12,185 | 64,465 | 19,342 | 285 | 31,745 | 525 | 12,568 |
| Saw logs | 38,329 | 2,520 | 997 | 15,134 | 3,121 | 16,557 | 202,656 | 14,146 | 5,230 | 73,764 | 18,986 | 90,530 |
| Fuelwood | 3,158 | 9 | 2 | 308 | 988 | 1,851 | 10,421 | 59 | 8 | 1,005 | 3,240 | 6,109 |
| Posts | 390 | -- | 390 | -- | -- | -- | 407 | -- | 407 | -- | -- | -- |
| Veneer logs | 318 | -- | -- | 47 | 79 | 192 | 2,295 | -- | -- | 342 | 566 | 1,387 |
| Poles | 25 | 25 | -- | -- | -- | -- | 99 | 99 | -- | -- | -- | -- |
| Other[3] | 7,585 | 220 | 296 | 5,894 | [4] | 1,175 | 13,007 | 678 | 959 | 10,137 | [4] | 1,233 |
| Total | 89,525 | 11,146 | 1,792 | 40,242 | 4,385 | 31,960 | 293,350 | 34,324 | 6,889 | 116,993 | 23,317 | 111,827 |
| LOGGING RESIDUE | 6,167 | 452 | 201 | 2,232 | 474 | 2,808 | 10,401 | 443 | 438 | 1,902 | 1,307 | 6,311 |
| OTHER REMOVALS | 8,832 | 378 | 1,280 | 2,755 | 451 | 3,968 | 21,533 | 1,201 | 983 | 7,980 | 893 | 10,476 |
| TOTAL REMOVALS | 104,524 | 11,976 | 3,273 | 45,229 | 5,310 | 38,736 | 325,284 | 35,968 | 8,310 | 126,875 | 25,517 | 128,614 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes charcoal wood, shingle bolts, cabin logs, particleboard bolts, pilings, etc.

[4] Less than 500 cubic feet.

Table 58.--Net annual growth and removals[1] of growing stock on commercial forest land by species group, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 7,359 | 872 |
| Red pine | 32,209 | 3,105 |
| Jack pine | 14,588 | 7,999 |
| White spruce | 2,483 | 87 |
| Black spruce | 1,081 | 88 |
| Balsam fir | 1,591 | 842 |
| Hemlock | 1,360 | 185 |
| Tamarack | -1,568 | 438 |
| Northern white-cedar | 14,711 | 1,633 |
| Other softwoods | 2,584 | -- |
| Total | 76,398 | 15,249 |
| HARDWOODS | | |
| Select white oaks | 5,645 | 3,006 |
| Select red oaks | 21,281 | 11,720 |
| Other red oaks | 4,565 | 3,541 |
| Hickory | 50 | 15 |
| Yellow birch | 799 | 40 |
| Hard maple | 23,690 | 5,310 |
| Soft maple | 42,752 | 8,839 |
| Beech | 1,378 | 1,539 |
| Ash | 13,059 | 2,090 |
| Balsam poplar | 1,226 | 784 |
| Cottonwood | 322 | 454 |
| Bigtooth aspen | 28,441 | 25,206 |
| Quaking aspen | 20,759 | 20,023 |
| Basswood | 9,876 | 1,980 |
| Yellow-poplar | -- | -- |
| Black walnut | 3 | -- |
| Butternut | 7 | -- |
| Elm | -2,502 | 1,731 |
| Paper birch | 9,155 | 2,579 |
| Other hardwoods[2] | 6,143 | 418 |
| Total | 186,649 | 89,275 |
| All species | 263,047 | 104,524 |

[1] Removals in 1979 are trend-level removals.

[2] Includes black cherry.

Table 59.--Net annual growth and removals[1] of sawtimber on commercial forest land by species group, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[2]

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 39,030 | 4,749 |
| Red pine | 73,439 | 10,636 |
| Jack pine | 56,093 | 20,583 |
| White spruce | 7,748 | 316 |
| Black spruce | -55 | 113 |
| Balsam fir | 7,348 | 3,264 |
| Hemlock | 5,597 | 805 |
| Tamarack | -1,882 | 185 |
| Northern white-cedar | 32,964 | 3,627 |
| Other softwoods | 4,288 | -- |
| Total | 224,570 | 44,278 |
| HARDWOODS | | |
| Select white oaks | 25,985 | 9,022 |
| Select red oaks | 113,864 | 38,084 |
| Other red oaks | 17,573 | 11,073 |
| Hickory | 128 | 93 |
| Yellow birch | 3,846 | 188 |
| Hard maple | 69,970 | 25,517 |
| Soft maple | 109,124 | 26,621 |
| Beech | 2,969 | 7,967 |
| Ash | 38,964 | 8,784 |
| Balsam poplar | 10,606 | 2,701 |
| Cottonwood | 1,025 | 2,332 |
| Bigtooth aspen | 111,076 | 63,600 |
| Quaking aspen | 90,673 | 63,275 |
| Basswood | 50,875 | 9,760 |
| Yellow-poplar | -- | -- |
| Black walnut | -- | -- |
| Butternut | 43 | -- |
| Elm | -1,315 | 5,975 |
| Paper birch | 19,022 | 5,208 |
| Other hardwoods[3] | 14,349 | 806 |
| Total | 678,777 | 281,006 |
| All species | 903,347 | 325,284 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes black cherry.

Table 60.--Net annual growth and removals[1] of growing stock on commercial forest land by ownership class and softwoods and hardwoods, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| Ownership class | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 30,724 | 17,660 | 13,064 | 11,709 | 3,676 | 8,033 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 192 | 42 | 150 | 9 | 3 | 6 |
| Indian | -- | -- | -- | -- | -- | -- |
| State | 69,372 | 22,597 | 46,775 | 18,486 | 4,337 | 14,149 |
| County and municipal | 1,854 | 376 | 1,478 | 52 | 8 | 44 |
| Forest industry | 2,840 | 507 | 2,333 | 2,074 | 8 | 2,066 |
| Farmer | 51,799 | 12,662 | 39,137 | [2] 72,194 | [2] 7,217 | [2] 64,977 |
| Misc. private-corp. | 18,311 | 4,154 | 14,157 | -- | -- | -- |
| Misc. private-indiv. | 87,955 | 18,400 | 69,555 | -- | -- | -- |
| All owners | 263,047 | 76,398 | 186,649 | 104,524 | 15,249 | 89,275 |

[1] Removals in 1979 are trend-level removals.

[2] Includes miscellaneous private-corporation and miscellaneous private-individual.

Table 61.--Net annual growth and removals[1] of sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[2]

| | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| Ownership class | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 85,037 | 48,425 | 36,612 | 26,058 | 9,063 | 16,995 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 23 | 23 | -- | 17 | 4 | 13 |
| Indian | -- | -- | -- | -- | -- | -- |
| State | 231,770 | 71,165 | 160,605 | 49,808 | 12,392 | 37,416 |
| County and municipal | 8,639 | 2,087 | 6,552 | 128 | 10 | 118 |
| Forest industry | 9,637 | 890 | 8,747 | 3,376 | 4 | 3,372 |
| Farmer | 173,729 | 33,855 | 139,874 | [3] 245,897 | [3] 22,805 | [3] 223,092 |
| Misc. private-corp. | 62,936 | 11,317 | 51,619 | -- | -- | -- |
| Misc. private-indiv. | 331,576 | 56,808 | 274,768 | -- | -- | -- |
| All owners | 903,347 | 224,570 | 678,777 | 325,284 | 44,278 | 281,006 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes miscellaneous private-corporation and miscellaneous private-individual.

Table 62.--Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, Northern Lower Peninsula, Michigan, 1965[1/] and 1979

(In million cubic feet)

| Species | 1965[1/] | 1979 |
|---|---|---|
| Softwoods | 5.8 | 10.0 |
| Hardwoods | 19.6 | 41.5 |
| Total | 25.4 | 51.5 |

1/Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures

Table 63.--Annual mortality of growing stock on commercial forest land by species group and cause, Northern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All causes | Cause: Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 227 | -- | 73 | -- | -- | 24 | 10 | 120 |
| Red pine | 50 | -- | 33 | -- | -- | 0 | -- | 17 |
| Jack pine | 1,426 | 21 | 214 | -- | 31 | 43 | 31 | 1,086 |
| White spruce | 319 | -- | 27 | -- | -- | 35 | -- | 257 |
| Black spruce | 493 | -- | 158 | -- | -- | 13 | -- | 322 |
| Balsam fir | 4,115 | 226 | 905 | -- | -- | 379 | 29 | 2,576 |
| Hemlock | 88 | -- | 3 | -- | -- | 3 | -- | 82 |
| Tamarack | 2,053 | -- | 129 | -- | -- | -- | -- | 1,924 |
| Northern white-cedar | 1,069 | -- | 294 | -- | -- | 461 | 31 | 283 |
| Other softwoods | 122 | -- | -- | -- | -- | -- | -- | 122 |
| Total | 9,962 | 247 | 1,836 | -- | 31 | 958 | 101 | 6,789 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 588 | -- | 113 | -- | -- | -- | -- | 475 |
| Select red oaks | 3,255 | 137 | 511 | -- | -- | 88 | 68 | 2,451 |
| Other red oaks | 720 | -- | -- | -- | -- | -- | -- | 720 |
| Hickory | 3 | -- | -- | -- | -- | -- | -- | 3 |
| Yellow birch | 244 | -- | -- | -- | -- | -- | -- | 244 |
| Hard maple | 2,988 | -- | 1,671 | -- | -- | -- | 149 | 1,168 |
| Soft maple | 1,579 | -- | 283 | -- | -- | 392 | -- | 904 |
| Beech | 1,635 | -- | -- | -- | -- | -- | -- | 1,635 |
| Ash | 1,462 | 263 | 366 | -- | -- | 358 | 73 | 402 |
| Balsam poplar | 2,114 | -- | 765 | -- | -- | 311 | -- | 1,038 |
| Cottonwood | 15 | -- | -- | -- | -- | -- | -- | 15 |
| Bigtooth aspen | 8,634 | -- | 3,928 | -- | -- | 656 | 95 | 3,955 |
| Quaking aspen | 11,963 | -- | 4,367 | -- | 72 | 2,369 | -- | 5,155 |
| Basswood | 1,154 | -- | 317 | -- | -- | 72 | -- | 765 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 1 | -- | -- | -- | -- | -- | -- | 1 |
| Black cherry | 9 | -- | 1 | -- | -- | -- | -- | 8 |
| Butternut | 1 | -- | -- | -- | -- | -- | -- | 1 |
| Elm | 4,238 | 13 | 3,215 | -- | 9 | 13 | -- | 988 |
| Paper birch | 892 | -- | 202 | -- | -- | 24 | -- | 666 |
| Other hardwoods | 66 | -- | 66 | -- | -- | -- | -- | -- |
| Total | 41,561 | 413 | 15,805 | -- | 81 | 4,283 | 385 | 20,594 |
| All species | 51,523 | 660 | 17,641 | -- | 112 | 5,241 | 486 | 27,383 |

Table 64.--Annual mortality of sawtimber on commercial forest land by species group and cause, Northern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| | | Cause | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All causes | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS | | | | | | | | |
| White pine | 856 | -- | 249 | -- | -- | 134 | -- | 473 |
| Red pine | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 4,166 | 111 | 661 | -- | 148 | 149 | 206 | 2,891 |
| White spruce | 1,258 | -- | 184 | -- | -- | -- | -- | 1,074 |
| Black spruce | 1,001 | -- | 1,001 | -- | -- | -- | -- | -- |
| Balsam fir | 8,542 | 499 | 1,684 | -- | -- | 971 | -- | 5,388 |
| Hemlock | 243 | -- | 12 | -- | -- | 8 | -- | 223 |
| Tamarack | 4,053 | -- | -- | -- | -- | -- | -- | 4,053 |
| Northern white-cedar | 1,466 | -- | 596 | -- | -- | 353 | -- | 517 |
| Other softwoods | 15 | -- | -- | -- | -- | -- | -- | 15 |
| Total | 21,600 | 610 | 4,387 | -- | 148 | 1,615 | 206 | 14,634 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 775 | -- | 775 | -- | -- | -- | -- | -- |
| Select red oaks | 9,657 | -- | 2,595 | -- | -- | -- | -- | 7,062 |
| Other red oaks | 1,861 | -- | -- | -- | -- | -- | -- | 1,861 |
| Hickory | 9 | -- | -- | -- | -- | -- | -- | 9 |
| Yellow birch | 574 | -- | -- | -- | -- | -- | -- | 574 |
| Hard maple | 4,820 | -- | 2,937 | -- | -- | -- | -- | 1,883 |
| Soft maple | 2,858 | -- | 281 | -- | -- | 823 | -- | 1,754 |
| Beech | 5,405 | -- | -- | -- | -- | -- | -- | 5,405 |
| Ash | 2,295 | -- | 2,295 | -- | -- | -- | -- | -- |
| Balsam poplar | 7,413 | -- | 2,710 | -- | -- | 1,849 | -- | 2,854 |
| Cottonwood | 57 | -- | -- | -- | -- | -- | -- | 57 |
| Bigtooth aspen | 17,919 | -- | 9,235 | -- | -- | 1,632 | -- | 7,052 |
| Quaking aspen | 27,046 | -- | 9,991 | -- | -- | 5,680 | -- | 11,375 |
| Basswood | 2,945 | -- | 743 | -- | -- | -- | -- | 2,202 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | 5 | -- | -- | -- | -- | -- | -- | 5 |
| Elm | 5,372 | 29 | 4,181 | -- | -- | 29 | -- | 1,133 |
| Paper birch | 896 | -- | 128 | -- | -- | 124 | -- | 644 |
| Other hardwoods | 160 | -- | 160 | -- | -- | -- | -- | -- |
| Total | 90,067 | 29 | 36,031 | -- | -- | 10,137 | -- | 43,870 |
| All species | 111,667 | 639 | 40,418 | -- | 148 | 11,752 | 206 | 58,504 |

[1] International 1/4-inch rule.

Table 65.--Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Northern Lower Peninsula, Michigan, 1979

| Ownership class | Growing stock |  |  | Sawtimber |  |  |
|---|---|---|---|---|---|---|
|  | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
|  | - - - Thousand cubic feet- - - |  |  | - - - [1]Thousand board feet- - - - |  |  |
| National Forest | 2,864 | 777 | 2,087 | 8,279 | 2,531 | 5,748 |
| Bureau of Land Management | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 68 | 2 | 66 | 1 | 1 | -- |
| Indian | -- | -- | -- | -- | -- | -- |
| State | 13,296 | 3,191 | 10,105 | 24,965 | 5,696 | 19,269 |
| County and municipal | 272 | 23 | 249 | 513 | 39 | 474 |
| Forest industry | 616 | 173 | 443 | 1,560 | 435 | 1,125 |
| Farmer | 11,650 | 2,217 | 9,433 | 26,037 | 3,779 | 22,258 |
| Misc. private-corp. | 4,219 | 1,080 | 3,139 | 11,780 | 4,216 | 7,564 |
| Misc. private-indiv. | 18,538 | 2,499 | 16,039 | 38,532 | 4,903 | 33,629 |
| All owners | 51,523 | 9,962 | 41,561 | 111,667 | 21,600 | 90,067 |

[1] International 1/4-inch rule.

Table 66.--Output of timber products by product, softwoods and hardwoods, and source of material, Northern Lower Peninsula, Michigan, 1978

| Product | Standard units | Total |  | Roundwood products |  |  |  | Plant byproducts |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Growing stock |  | Nongrowing stock |  |  |  |
|  |  | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet |
| PULPWOOD |  |  |  |  |  |  |  |  |  |
| Softwood | [1]Standard cords | 126,891 | 10,010 | 107,489 | 8,479 | 15,060 | 1,188 | 4,342 | 343 |
| Hardwood |  | 489,459 | 38,613 | 396,056 | 31,241 | 55,755 | 4,398 | 37,648 | 2,974 |
| Total |  | 616,350 | 48,623 | 503,545 | 39,720 | 70,815 | 5,586 | 41,990 | 3,317 |
| SAW LOGS |  |  |  |  |  |  |  |  |  |
| Softwood | [2]Thousand board feet | 20,569 | 3,646 | 19,841 | 3,517 | 728 | 129 | -- | -- |
| Hardwood |  | 206,583 | 35,914 | 200,244 | 34,812 | 6,339 | 1,102 | -- | -- |
| Total |  | 227,152 | 39,560 | 220,085 | 38,329 | 7,067 | 1,231 | -- | -- |
| VENEER LOGS |  |  |  |  |  |  |  |  |  |
| Softwood | [2]Thousand board feet | -- | -- | -- | -- | -- | -- | -- | -- |
| Hardwood |  | 2,295 | 318 | 2,295 | 318 | -- | -- | -- | -- |
| Total |  | 2,295 | 318 | 2,295 | 318 | -- | -- | -- | -- |
| FUELWOOD |  |  |  |  |  |  |  |  |  |
| Softwood | [1]Standard cords | 12,729 | 871 | 213 | 11 | 873 | 45 | 11,643 | 815 |
| Hardwood |  | 245,457 | 17,133 | 45,146 | 3,147 | 121,897 | 8,497 | 78,414 | 5,489 |
| Total |  | 258,186 | 18,004 | 45,359 | 3,158 | 122,770 | 8,542 | 90,057 | 6,304 |
| POSTS |  |  |  |  |  |  |  |  |  |
| Softwood | Thousand pieces | 422 | 425 | 387 | 390 | 35 | 35 | -- | -- |
| Hardwood |  | -- | -- | -- | -- | -- | -- | -- | -- |
| Total |  | 422 | 425 | 387 | 390 | 35 | 35 | -- | -- |
| POLES |  |  |  |  |  |  |  |  |  |
| Softwood | Pieces | 2,908 | 25 | 2,908 | 25 | -- | -- | -- | -- |
| Hardwood |  | -- | -- | -- | -- | -- | -- | -- | -- |
| Total |  | 2,908 | 25 | 2,908 | 25 | -- | -- | -- | -- |
| OTHER [3] |  |  |  |  |  |  |  |  |  |
| Softwood | Thousand cubic feet | 808 | 808 | 516 | 516 | 49 | 49 | 243 | 243 |
| Hardwood |  | 12,254 | 12,254 | 7,069 | 7,069 | 946 | 946 | 4,239 | 4,239 |
| Total |  | 13,062 | 13,062 | 7,585 | 7,585 | 995 | 995 | 4,482 | 4,482 |
| ALL PRODUCTS |  |  |  |  |  |  |  |  |  |
| Softwood | Thousand cubic feet | -- | 15,785 | -- | 12,938 | -- | 1,446 | -- | 1,401 |
| Hardwood |  | -- | 104,232 | -- | 76,587 | -- | 14,943 | -- | 12,702 |
| Total |  | -- | 120,017 | -- | 89,525 | -- | 16,389 | -- | 14,103 |

[1] Rough-wood, 128 cubic foot basis.

[2] International 1/4-inch rule.

[3] Other (industrial production) includes cabin logs, charcoal wood, particleboard bolts, shingle bolts, pilings, etc.

Northern Lower Peninsula, Michigan, 1978

(In thousand cubic feet)

| Product and species group | All sources | Growing-stock trees |  |  | Rough and rotten trees | Salvable dead trees | Other sources |
|---|---|---|---|---|---|---|---|
|  |  | Total | Sawtimber | Poletimber |  |  |  |
| INDUSTRIAL PRODUCTS |  |  |  |  |  |  |  |
| Saw logs |  |  |  |  |  |  |  |
| Softwood | 3,646 | 3,517 | 3,466 | 51 | 4 | 51 | 74 |
| Hardwood | 35,914 | 34,812 | 31,837 | 2,975 | 310 | 164 | 628 |
| Subtotal | 39,560 | 38,329 | 35,303 | 3,026 | 314 | 215 | 702 |
| Veneer logs and bolts |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 318 | 318 | 318 | -- | -- | -- | -- |
| Subtotal | 318 | 318 | 318 | -- | -- | -- | -- |
| Pulpwood |  |  |  |  |  |  |  |
| Softwood | 9,667 | 8,479 | 5,013 | 3,466 | 189 | 354 | 645 |
| Hardwood | 35,639 | 31,241 | 11,829 | 19,412 | 1,700 | 540 | 2,158 |
| Subtotal | 45,306 | 39,720 | 16,842 | 22,878 | 1,889 | 894 | 2,803 |
| Cooperage |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Piling |  |  |  |  |  |  |  |
| Softwood | 2 | 2 | 2 | -- |  |  |  |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 2 | 2 | 2 | -- | -- | -- | -- |
| Poles |  |  |  |  | -- | -- | -- |
| Softwood | 25 | 25 | 20 | 5 |  |  |  |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 25 | 25 | 20 | 5 | -- | -- | -- |
| Mine timbers (Round) |  |  |  |  | -- | -- | -- |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Posts (Round and split) |  |  |  |  |  |  |  |
| Softwood | 425 | 390 | 101 | 289 | 3 | -- | 32 |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 425 | 390 | 101 | 289 | 3 | -- | 32 |
| Other |  |  |  |  |  |  |  |
| Softwood | 563 | 514 | 330 | 184 | -- | 7 | 42 |
| Hardwood | 8,015 | 7,069 | 2,796 | 4,273 | 255 | 81 | 610 |
| Subtotal | 8,578 | 7,583 | 3,126 | 4,457 | 255 | 88 | 652 |
| All industrial products |  |  |  |  |  |  |  |
| Softwood | 14,328 | 12,927 | 8,932 | 3,995 | 196 | 412 | 793 |
| Hardwood | 79,886 | 73,440 | 46,780 | 26,660 | 2,265 | 785 | 3,396 |
| Total | 94,214 | 86,367 | 55,712 | 30,655 | 2,461 | 1,197 | 4,189 |
| FUELWOOD |  |  |  |  |  |  |  |
| Softwood | 56 | 11 | 7 | 4 | 1 | -- | 44 |
| Hardwood | 11,644 | 3,147 | 1,832 | 1,315 | 657 | -- | 7,840 |
| Total | 11,700 | 3,158 | 1,839 | 1,319 | 658 | -- | 7,884 |
| ALL PRODUCTS |  |  |  |  |  |  |  |
| Softwood | 14,384 | 12,938 | 8,939 | 3,999 | 197 | 412 | 837 |
| Hardwood | 91,530 | 76,587 | 48,612 | 27,975 | 2,922 | 785 | 11,236 |

Table 68.--Timber products from roundwood by species group and product, Northern Lower Peninsula, Michigan, 1978

| Species group | All Products | Pulpwood | | Saw logs | | Veneer logs | |
|---|---|---|---|---|---|---|---|
| | [1]Thousand cubic feet | Cords | [1]Thousand cubic feet | [2]Thousand board feet | [1]Thousand cubic feet | [2]Thousand board feet | [1]Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 739 | 133 | 7 | 4,382 | 725 | -- | -- |
| Red pine | 3,255 | 30,709 | 2,423 | 4,639 | 767 | -- | -- |
| Jack pine | 8,507 | 90,252 | 7,129 | 5,921 | 1,109 | -- | -- |
| White spruce | 39 | 144 | 10 | 35 | 6 | -- | -- |
| Black spruce | 37 | 134 | 9 | 32 | 5 | -- | -- |
| Balsam fir | 692 | 922 | 72 | 2,844 | 536 | -- | -- |
| Hemlock | 120 | 255 | 17 | 619 | 103 | -- | -- |
| Tamarack | 8 | -- | -- | 45 | 8 | -- | -- |
| Northern white-cedar | 987 | -- | -- | 2,052 | 387 | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 14,384 | 122,549 | 9,667 | 20,569 | 3,646 | -- | -- |
| HARDWOODS | | | | | | | |
| Select white oaks | 3,169 | 17,814 | 1,392 | 8,123 | 1,418 | -- | -- |
| Select red oaks | 14,917 | 74,126 | 5,851 | 41,374 | 7,261 | -- | -- |
| Other red oaks | 1,533 | 7,619 | 601 | 4,253 | 746 | -- | -- |
| Hickory | 15 | -- | -- | 93 | 15 | -- | -- |
| Yellow birch | 28 | -- | -- | 135 | 22 | 42 | 6 |
| Hard maple | 7,277 | 4,057 | 319 | 19,948 | 3,224 | 566 | 79 |
| Soft maple | 8,635 | 58,922 | 4,647 | 16,322 | 2,854 | 337 | 46 |
| Beech | 1,171 | 2,696 | 209 | 4,500 | 750 | 352 | 49 |
| Ash | 2,181 | 5,114 | 397 | 7,459 | 1,301 | 152 | 21 |
| Balsam poplar | 640 | 4,995 | 396 | 1,051 | 182 | -- | -- |
| Cottonwood | 393 | -- | -- | 2,146 | 377 | 112 | 16 |
| Bigtooth aspen | 22,115 | 130,694 | 10,322 | 44,656 | 7,850 | 174 | 24 |
| Quaking aspen | 21,347 | 126,156 | 9,963 | 43,106 | 7,578 | 168 | 23 |
| Basswood | 1,798 | 1,583 | 126 | 8,924 | 1,561 | 352 | 49 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- |
| Elm | 3,487 | -- | -- | 1,372 | 237 | -- | -- |
| Paper birch | 2,487 | 16,059 | 1,264 | 2,678 | 467 | 40 | 5 |
| Other hardwoods[3] | 337 | 1,976 | 152 | 443 | 71 | -- | -- |
| Total | 91,530 | 451,811 | 35,639 | 206,583 | 35,914 | 2,295 | 318 |
| All species | 105,914 | 574,360 | 45,306 | 227,152 | 39,560 | 2,295 | 318 |

(Table 68 continued on next page)

[1] Small quantities may round off to less than 500 cubic feet and will be shown as a dash in columns showing thousand cubic feet.

[2] International 1/4-inch rule.

[3] Includes black cherry.

(Table 68 continued)

| Species group | Fuelwood | | Posts | | Poles | | Other Products |
|---|---|---|---|---|---|---|---|
| | Cords | 1/Thousand cubic feet | Thousand pieces | 1/Thousand cubic feet | Pieces | 1/Thousand cubic feet | 1/Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 177 | 7 | -- | -- | -- | -- | |
| Red pine | 177 | 6 | -- | -- | 2,908 | 25 | 34 |
| Jack pine | 604 | 34 | -- | -- | -- | -- | 235 |
| White spruce | -- | -- | 10 | 9 | -- | -- | 14 |
| Black spruce | -- | -- | 10 | 9 | -- | -- | 14 |
| Balsam fir | -- | -- | 57 | 56 | -- | -- | 28 |
| Hemlock | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 128 | 9 | 345 | 351 | -- | -- | 240 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,086 | 56 | 422 | 425 | 2,908 | 25 | 565 |
| HARDWOODS | | | | | | | |
| Select white oaks | 5,119 | 359 | -- | -- | -- | -- | -- |
| Select red oaks | 21,125 | 1,469 | -- | -- | -- | -- | 336 |
| Other red oaks | 2,171 | 151 | -- | -- | -- | -- | 35 |
| Hickory | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 52,296 | 3,655 | -- | -- | -- | -- | -- |
| Soft maple | 7,396 | 517 | -- | -- | -- | -- | 571 |
| Beech | 2,417 | 163 | -- | -- | -- | -- | -- |
| Ash | 6,589 | 462 | -- | -- | -- | -- | -- |
| Balsam poplar | 884 | 62 | -- | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 8,248 | 575 | -- | -- | -- | -- | 3,344 |
| Quaking aspen | 7,961 | 555 | -- | -- | -- | -- | 3,228 |
| Basswood | 933 | 62 | -- | -- | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- |
| Elm | 46,534 | 3,250 | -- | -- | -- | -- | -- |
| Paper birch | 3,674 | 250 | -- | -- | -- | -- | 501 |
| Other hardwoods | 1,696 | 114 | -- | -- | -- | -- | -- |
| Total | 167,043 | 11,644 | -- | -- | -- | -- | 8,015 |
| All species | 168,129 | 11,700 | 422 | 425 | 2,908 | 25 | 8,580 |

Table 69.--Volume of primary plant residue by use and type of residue, Northern Lower Peninsula, Michigan, 1978

(In thousand cubic feet)

| Use | Wood residue | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Coarse[1] | | Fine[2] | | Bark[3] | |
| | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood |
| Fiber products[4] | 302.2 | 4,318.9 | 302.2 | 4,279.7 | -- | 39.2 | -- | 104.1 |
| Charcoal | -- | -- | -- | -- | -- | -- | -- | 3.0 |
| Industrial fuel | 348.6 | 1,354.6 | 110.4 | 322.2 | 238.2 | 1,032.4 | 230.6 | 1,041.1 |
| Domestic fuel | 465.8 | 4,134.3 | 464.0 | 4,078.2 | 1.8 | 56.1 | 141.6 | 2,064.5 |
| Miscellaneous[5] | 243.2 | 2,893.5 | 0.3 | 14.4 | 242.9 | 2,879.1 | 123.3 | 1,197.0 |
| Not used[6] | 276.3 | 2,653.5 | 156.4 | 967.4 | 119.9 | 1,686.1 | 198.4 | 1,802.3 |
| Total | 1,636.1 | 15,354.8 | 1,033.3 | 9,661.9 | 602.8 | 5,692.9 | 693.9 | 6,212.0 |

[1] Suitable for chipping such as slabs, edgings, veneer cores, etc.

[2] Not suitable for chipping such as sawdust, veneer clippings, etc.

[3] Does not include bark disposal at pulpmills.

[4] For manufacture of pulp, hardboard, or roofing felt.

[5] Livestock bedding, mulch, small dimension, and specialty items.

[6] Includes residue burned as waste.

Table 70.--All live shrub[1] biomass yields on commercial forest land by shrub species group and forest type, Northern Lower Peninsula, Michigan, 1980

(In pounds per acre)

| Shrub species group | Forest type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| TALL SHRUBS | | | | | | | | | | | | | | | |
| Balsam fir | 0.4 | 0.4 | 49.6 | 426.4 | 75.6 | 154.8 | 269.2 | 6.0 | 0.8 | 55.2 | 10.4 | 78.8 | 182.4 | -- | -- |
| Tamarack | -- | -- | -- | 32.0 | 159.6 | 52.8 | 0.4 | 60.0 | -- | 4.0 | -- | -- | -- | -- | -- |
| White spruce | -- | -- | 0.8 | 32.0 | 6.8 | -- | 13.2 | -- | -- | -- | 2.0 | 2.4 | 1.2 | -- | -- |
| Black spruce | 0.4 | 8.4 | 0.8 | 6.8 | 0.8 | 126.4 | 27.2 | 120.4 | -- | 0.4 | -- | 1.2 | 1.2 | -- | -- |
| Jack pine | 141.6 | 5.6 | -- | -- | -- | -- | -- | -- | 34.8 | -- | -- | 3.2 | -- | -- | -- |
| Red pine | 11.6 | 27.6 | -- | -- | -- | -- | -- | -- | 4.4 | -- | 2.0 | -- | -- | -- | -- |
| White pine | 12.8 | 28.4 | 188.8 | -- | -- | -- | -- | -- | 45.6 | -- | 7.2 | 5.6 | 17.2 | -- | -- |
| Scotch pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 104.8 | -- |
| Northern white-cedar | -- | -- | -- | 7.6 | 86.8 | 48.0 | 73.6 | 3.2 | -- | 1.2 | 5.6 | 2.8 | 19.6 | -- | -- |
| Hemlock | -- | -- | -- | 37.6 | -- | -- | 0.4 | -- | -- | 2.8 | 4.8 | 0.4 | -- | -- | -- |
| Red maple | 12.4 | 41.6 | 6.0 | 6.8 | 138.8 | -- | 36.0 | 10.4 | 88.0 | 91.2 | 60.8 | 93.6 | 55.6 | 2.8 | -- |
| Silver maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | -- | 4.4 | -- | -- | -- |
| Sugar maple | -- | 13.2 | -- | 1.2 | -- | -- | -- | -- | 0.4 | 0.4 | 131.6 | 8.4 | 1.6 | 0.4 | -- |
| Mountain maple | -- | -- | -- | -- | -- | -- | 22.8 | -- | -- | 70.0 | 0.8 | 12.4 | 6.0 | -- | -- |
| Red alder | -- | -- | 14.4 | -- | -- | -- | 0.4 | -- | -- | -- | -- | 3.6 | -- | -- | -- |
| Green alder | 50.4 | -- | -- | -- | -- | 356.8 | -- | -- | 3.6 | 0.8 | 0.4 | 2.0 | 0.8 | -- | -- |
| Speckled alder | 60.0 | 0.8 | 66.8 | 481.2 | 332.4 | 2,097.2 | 297.6 | 2,477.2 | 18.0 | 633.6 | 30.8 | 111.2 | 306.8 | -- | 665.2 |
| Yellow birch | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.2 | 2.4 | 0.8 | -- | 17.2 | -- |
| Paper birch | 0.8 | -- | 2.8 | 1.2 | 3.6 | -- | 0.4 | -- | -- | 7.6 | 7.6 | 6.8 | 11.2 | -- | -- |
| American hornbeam | -- | 38.4 | -- | -- | -- | -- | -- | -- | 2.0 | 2.0 | 6.4 | 1.2 | 2.4 | -- | -- |
| Dogwood | 2.0 | 0.8 | 195.2 | 98.4 | 168.4 | 57.2 | 156.8 | 47.2 | 20.4 | 244.8 | 33.2 | 158.0 | 446.4 | 0.8 | 67.2 |
| Hawthorn | 8.8 | 26.4 | -- | -- | -- | -- | -- | -- | 5.6 | 2.4 | 2.0 | 3.6 | -- | -- | -- |
| Beech | -- | 7.6 | -- | -- | -- | -- | -- | 0.4 | 1.2 | 0.4 | 19.2 | 2.4 | -- | -- | -- |
| White ash | -- | 2.8 | -- | 0.8 | -- | -- | 0.4 | -- | 6.0 | 16.0 | 39.2 | 23.2 | 28.0 | 1.2 | -- |
| Black ash | -- | -- | -- | 1.2 | -- | -- | 88.4 | 3.2 | -- | 126.0 | 5.6 | 21.2 | 10.0 | -- | -- |
| Green ash | -- | 0.4 | -- | -- | -- | -- | 11.2 | -- | 0.4 | 85.2 | 5.2 | 15.2 | 3.6 | -- | -- |
| Black alder | -- | -- | -- | -- | -- | -- | 12.4 | 18.0 | -- | 64.4 | 8.0 | 1.2 | -- | -- | -- |
| Mountain holly | -- | -- | -- | -- | 2.4 | -- | -- | 0.4 | -- | 31.6 | -- | -- | 2.8 | -- | -- |
| Spice bush | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15.2 | 11.2 | -- | -- | -- | 0.4 |
| Eastern hophornbeam | -- | -- | -- | -- | -- | -- | -- | -- | 8.0 | -- | 104.0 | 30.0 | 1.2 | 23.2 | -- |
| Balsam poplar | -- | -- | -- | 10.0 | 5.6 | -- | 18.0 | -- | -- | 12.8 | 0.4 | 14.0 | 24.0 | -- | -- |
| Bigtooth aspen | 2.0 | 6.0 | -- | -- | -- | -- | -- | -- | 7.2 | -- | 5.2 | 85.6 | 56.8 | 18.4 | -- |
| Quaking aspen | 6.0 | 21.6 | 1.6 | 3.6 | 3.6 | -- | 5.2 | 12.4 | 5.6 | 23.2 | 40.8 | 196.8 | 50.0 | 22.0 | -- |
| Pincherry | 18.0 | 0.4 | -- | 0.4 | -- | -- | -- | -- | 3.6 | 1.6 | 2.0 | 2.8 | -- | -- | -- |
| Black cherry | 29.6 | 36.8 | 19.6 | 64.4 | 2.8 | 48.4 | 3.6 | -- | 126.0 | 21.6 | 60.4 | 86.4 | 10.8 | 17.2 | 1.2 |
| Chokecherry | 8.4 | 2.8 | 1.2 | 0.4 | 0.4 | -- | 4.4 | 2.4 | 15.2 | 13.2 | 14.0 | 23.6 | 4.0 | 4.8 | 1.2 |
| White oak | 9.2 | 0.8 | 27.2 | -- | 0.4 | -- | -- | -- | 70.0 | 1.2 | 9.6 | 6.8 | -- | 0.8 | -- |
| Northern pin oak | -- | -- | -- | 6.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern red oak | 90.4 | 23.6 | 8.0 | 1.2 | 1.2 | -- | 0.8 | -- | 189.6 | 3.2 | 18.8 | 43.2 | 2.4 | 12.8 | 3.2 |
| Black oak | 12.4 | -- | 0.4 | -- | -- | -- | -- | -- | 25.2 | 0.4 | -- | 2.8 | -- | -- | -- |
| Sweet gale | -- | -- | -- | -- | -- | -- | -- | -- | -- | 44.0 | -- | 0.4 | -- | -- | -- |

(Table 70 continued on next page)

(Table 70 continued)

| Shrub species group | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TALL SHRUBS (continued) | | | | | | | | | | | | | | | |
| Mountain ash | -- | -- | -- | -- | -- | -- | 16.4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Witch hazel | -- | -- | 21.6 | -- | -- | -- | -- | -- | 41.2 | 7.6 | 14.0 | 64.4 | 28.0 | -- | -- |
| Juneberry | 23.2 | 13.6 | 68.8 | 0.4 | 6.8 | -- | 33.6 | 5.6 | 19.2 | 7.6 | 24.4 | 45.6 | 14.4 | 1.6 | 11.2 |
| Hazel | -- | 26.0 | 2.0 | -- | 8.0 | -- | 22.8 | -- | 21.6 | 31.6 | 24.4 | 29.2 | -- | -- | -- |
| Prickly ash | -- | -- | -- | -- | -- | -- | -- | -- | 1.6 | 4.4 | 2.8 | -- | -- | -- | -- |
| Alder buckthorn | -- | -- | -- | 0.8 | -- | 0.4 | 6.8 | 0.4 | -- | 6.4 | -- | 0.4 | -- | -- | -- |
| Viburnum | 10.4 | 17.6 | 0.8 | 122.4 | 0.8 | 10.8 | 74.4 | 20.0 | 38.8 | 191.6 | 11.6 | 90.0 | 135.6 | 0.4 | -- |
| Elder | -- | -- | -- | -- | -- | -- | 3.6 | -- | 0.4 | 10.4 | 6.4 | 2.8 | 0.4 | -- | 1.2 |
| Sumac | -- | 48.0 | -- | -- | -- | -- | 1.2 | 0.4 | 4.8 | -- | 18.0 | 18.0 | -- | 4.0 | 6.8 |
| Willow | 84.0 | 1.2 | -- | 170.0 | -- | -- | 4.8 | 47.6 | 1.6 | 60.4 | 10.4 | 69.2 | 139.6 | 25.6 | 33.2 |
| Sassafras | -- | 2.0 | 0.4 | -- | -- | -- | -- | -- | 14.0 | 1.2 | 3.2 | 2.4 | -- | -- | -- |
| American basswood | -- | -- | -- | -- | -- | -- | -- | -- | 0.4 | 3.6 | 10.0 | 0.4 | 1.6 | -- | -- |
| American elm | 17.2 | -- | -- | -- | -- | -- | 0.4 | 0.4 | 1.2 | 29.6 | 8.8 | 5.6 | 188.4 | 0.8 | -- |
| Total | 612.0 | 402.8 | 676.8 | 1,513.2 | 1,004.8 | 2,952.8 | 1,206.4 | 2,835.6 | 826.4 | 1,941.2 | 785.6 | 1,384.0 | 1,754.0 | 258.8 | 790.8 |
| LOW SHRUBS | | | | | | | | | | | | | | | |
| Common juniper | -- | -- | 20.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yew | -- | -- | -- | -- | -- | 5.7 | 2.5 | 4.3 | -- | -- | 3.9 | -- | -- | -- | -- |
| Holly | -- | -- | -- | -- | -- | -- | 2.7 | -- | -- | 1.6 | -- | -- | -- | -- | -- |
| Virginia creeper | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.0 | 1.1 | -- | 2.1 | -- | -- |
| Spirea | -- | -- | -- | -- | -- | -- | -- | 5.7 | -- | 1.5 | -- | -- | 2.0 | -- | -- |
| Labrador tea | -- | -- | 41.3 | 31.1 | -- | 472.0 | 9.7 | -- | -- | 83.0 | -- | -- | -- | -- | -- |
| Leatherleaf | 57.7 | -- | 193.8 | -- | -- | 466.7 | 1.6 | 338.4 | 12.4 | 37.7 | -- | 24.1 | -- | -- | -- |
| Bog laurel | 2.9 | -- | -- | -- | -- | 28.2 | 1.7 | 2.7 | -- | 1.0 | -- | -- | -- | -- | -- |
| Sweetfern | 50.0 | 13.3 | 1.6 | -- | -- | -- | -- | -- | 23.3 | -- | 6.8 | 6.9 | -- | 5.7 | 1.2 |
| Gooseberry-currant | -- | -- | -- | 2.6 | -- | -- | 1.1 | 1.0 | -- | 13.5 | -- | -- | 2.9 | -- | -- |
| Chokeberry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1 | -- | -- |
| Raspberry-blackerry | 11.0 | 21.2 | 37.7 | 1.8 | 2.0 | 61.6 | 9.9 | 66.2 | 14.4 | 30.8 | 35.0 | 38.6 | 72.2 | 49.2 | 6.4 |
| Rose | -- | -- | -- | 2.7 | -- | -- | -- | -- | 1.1 | 1.6 | -- | -- | -- | -- | -- |
| Bilberry-blueberry | 463.2 | 137.8 | 3.4 | 61.3 | 14.3 | 105.4 | 7.5 | 4.7 | 166.8 | 12.4 | 25.0 | 41.4 | 12.6 | -- | 16.1 |
| Bush honeysuckle | -- | 4.4 | -- | 7.6 | -- | -- | -- | -- | 1.6 | -- | -- | 1.8 | 2.8 | -- | -- |
| Honeysuckle | -- | 8.4 | -- | 8.7 | -- | 3.9 | 3.4 | 2.8 | 3.7 | 5.6 | 4.6 | 5.1 | 2.9 | -- | -- |
| Bearberry | 10.0 | -- | -- | -- | -- | -- | 2.1 | -- | -- | 1.2 | -- | -- | -- | -- | -- |
| Bog rosemary | -- | -- | -- | -- | -- | 2.0 | -- | 5.2 | -- | -- | -- | 1.0 | -- | -- | -- |
| Grape | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.7 | -- | -- | 1.1 | -- | -- |
| Total | 594.8 | 185.1 | 298.6 | 115.8 | 16.3 | 1,145.5 | 42.2 | 431.0 | 233.3 | 196.6 | 76.4 | 118.9 | 99.7 | 54.9 | 23.7 |
| All shrubs | 1,206.8 | 587.9 | 975.4 | 1,629.0 | 1,021.1 | 4,098.3 | 1,248.6 | 3,266.6 | 1,049.7 | 2,137.8 | 862.0 | 1,502.9 | 1,853.7 | 313.7 | 814.5 |
| Number of plots[2] | 128 | 84 | 29 | 20 | 8 | 13 | 133 | 12 | 321 | 161 | 633 | 633 | 45 | 27 | 20 |

[1] Trees under 1.0-inch d.b.h. are also included. Low shrub species that averaged less than 1.0 pound per acre are not included.

[2] Number of plots by forest type from which average yields were derived.

Table 71.--All live tree biomass yields on commercial forest land by species group and forest type, Northern Lower Peninsula, Michigan, 1980

(In pounds per acre)

| Shrub species group | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 1,684 | 5,440 | 101,416 | 8,600 | 2,928 | 5,992 | 4,828 | 4,652 | 2,792 | 3,104 | 3,504 | 2,716 | 2,576 | 192 | 644 |
| Red pine | 11,732 | 147,828 | 22,628 | 1,548 | -- | -- | 624 | -- | 4,580 | 728 | 2,024 | 3,212 | 2,984 | 13,796 | 560 |
| Jack pine | 109,992 | 17,604 | 5,352 | 164 | -- | -- | -- | 3,140 | 8,172 | 124 | 1,260 | 1,540 | -- | 3,224 | 764 |
| White spruce | -- | 404 | 2,852 | 9,388 | 55,904 | 1,000 | 5,632 | -- | -- | 596 | 80 | 588 | 668 | 32 | -- |
| Black spruce | 156 | 140 | 1,684 | 5,796 | 2,380 | 57,344 | 10,004 | 9,704 | 16 | 336 | 8 | 116 | 140 | -- | -- |
| Balsam fir | 48 | 448 | 4,148 | 72,256 | 28,152 | 10,304 | 26,676 | 10,572 | 244 | 4,212 | 692 | 4,864 | 11,156 | -- | 332 |
| Hemlock | -- | 644 | -- | -- | -- | -- | 4,120 | -- | 92 | 2,220 | 5,980 | 640 | 2,772 | -- | -- |
| Tamarack | 32 | -- | -- | 828 | 1,516 | 6,300 | 11,560 | 87,096 | 16 | 612 | 140 | 104 | 1,128 | -- | 468 |
| Northern white-cedar | -- | 440 | 1,364 | 13,848 | 24,820 | 22,400 | 151,340 | 14,352 | 48 | 13,708 | 2,836 | 5,204 | 15,216 | 188 | 132 |
| Other softwoods | -- | 1,244 | 14,012 | -- | 8,172 | -- | 1,024 | -- | 72 | 28 | 204 | 140 | -- | 141,712 | 192 |
| Total | 123,644 | 174,192 | 153,456 | 112,428 | 123,872 | 103,340 | 215,808 | 129,516 | 16,032 | 25,668 | 16,728 | 19,124 | 36,640 | 159,144 | 3,092 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 1,340 | 4,332 | 11,472 | -- | -- | -- | -- | -- | 48,104 | 2,252 | 2,244 | 2,520 | 1,248 | 1,296 | -- |
| Select red oaks | 13,956 | 7,548 | 13,212 | 64 | -- | -- | -- | -- | 99,040 | 1,804 | 12,484 | 13,472 | 8,224 | 3,800 | 500 |
| Other red oaks | 6,132 | 6,812 | -- | -- | -- | -- | -- | -- | 32,348 | 272 | 632 | 932 | -- | -- | -- |
| Hickory | -- | 268 | -- | -- | -- | -- | -- | -- | -- | -- | 260 | -- | 308 | -- | -- |
| Yellow birch | -- | -- | 928 | -- | -- | -- | 1,960 | -- | 76 | 4,052 | 3,824 | 212 | 2,904 | 416 | -- |
| Hard maple | 52 | 872 | -- | 1,980 | -- | -- | 368 | -- | 928 | 2,844 | 94,848 | 3,132 | 6,700 | 4,220 | 1,516 |
| Soft maple | 2,032 | 5,292 | 9,024 | 17,664 | 1,440 | 2,860 | 11,088 | 5,080 | 17,900 | 77,944 | 36,148 | 21,688 | 24,524 | 1,156 | 1,376 |
| Beech | -- | 220 | 712 | -- | -- | -- | -- | -- | 516 | 216 | 16,720 | 900 | 2,916 | -- | -- |
| Ash | -- | 324 | 784 | 2,804 | -- | -- | 14,652 | 1,996 | 1,100 | 46,348 | 15,776 | 3,660 | 9,044 | 268 | 1,576 |
| Balsam poplar | -- | -- | -- | 1,944 | 11,052 | 6,820 | 6,208 | 1,364 | 36 | 3,780 | 380 | 6,180 | 3,212 | 3,972 | 132 |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | 20 | 2,584 | 188 | 268 | -- | -- | -- |
| Bigtooth aspen | 1,264 | 3,576 | 7,496 | 1,032 | 1,492 | -- | 2,008 | -- | 14,900 | 2,344 | 11,400 | 47,228 | 7,104 | 3,996 | 1,024 |
| Quaking aspen | 3,596 | 4,388 | 13,640 | 30,560 | 16,752 | 5,712 | 7,464 | 1,552 | 3,488 | 13,276 | 11,956 | 51,568 | 19,544 | 2,568 | 1,564 |
| Basswood | 184 | 252 | -- | -- | -- | -- | 800 | -- | 424 | 4,668 | 26,892 | 1,252 | 4,688 | 1,100 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | 92 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 560 | 1,244 | 1,108 | 1,544 | -- | 448 | 272 | -- | 1,492 | 1,644 | 8,736 | 2,796 | 932 | 1,376 | 6,752 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | 16 | -- | 16 | -- | -- | -- | -- |
| Elm | 120 | -- | 232 | 44 | -- | 1,580 | 1,044 | -- | 28 | 4,888 | 3,800 | 596 | 1,440 | 372 | 548 |
| Paper birch | 120 | 368 | 5,064 | 30,284 | 576 | 5,260 | 19,596 | 5,780 | 2,040 | 9,404 | 6,304 | 9,120 | 91,132 | -- | -- |
| Other hardwoods | -- | 80 | -- | -- | -- | -- | 244 | -- | 880 | 2,360 | 532 | 308 | 264 | -- | -- |
| Noncommercial species | 60 | 308 | -- | -- | -- | 608 | 240 | -- | 232 | 412 | 3,988 | 992 | 1,388 | 508 | 1,076 |
| Total | 29,416 | 35,976 | 63,672 | 87,920 | 31,312 | 23,288 | 65,944 | 15,772 | 223,568 | 181,092 | 257,128 | 166,824 | 185,572 | 25,048 | 16,064 |
| All species | 153,060 | 210,168 | 217,128 | 200,348 | 155,184 | 126,628 | 281,752 | 145,288 | 239,600 | 206,760 | 273,856 | 185,948 | 222,212 | 184,192 | 19,156 |
| Number of plots[1] | 201 | 153 | 32 | 22 | 9 | 13 | 146 | 13 | 418 | 187 | 707 | 744 | 51 | 27 | 29 |

[1] Number of plots by forest type from which average yields were derived.

## Table 72.--All live tree biomass on commercial forest land by species group and forest type, Northern Lower Peninsula, Michigan, 1980

(In green tons)

| Species group | All types | Forest type |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 7,178,962 | 213,273 | 580,863 | 1,906,644 | 110,505 | 16,036 | 41,935 | 429,082 |
| Red pine | 21,656,416 | 1,486,296 | 15,780,795 | 425,372 | 19,909 | -- | -- | 55,291 |
| Jack pine | 19,415,814 | 13,933,148 | 1,879,235 | 100,612 | 2,117 | -- | -- | -- |
| White spruce | 1,411,468 | -- | 43,191 | 53,654 | 120,621 | 306,074 | 7,007 | 500,387 |
| Black spruce | 1,618,318 | 19,947 | 14,992 | 31,693 | 74,491 | 13,031 | 401,411 | 889,138 |
| Balsam fir | 7,062,318 | 5,890 | 47,746 | 78,003 | 928,490 | 154,135 | 72,115 | 2,370,831 |
| Hemlock | 3,544,701 | -- | 68,955 | -- | -- | -- | -- | 366,156 |
| Tamarack | 1,972,926 | 4,158 | -- | -- | 10,650 | 8,305 | 44,095 | 1,027,425 |
| Northern white-cedar | 19,525,237 | -- | 46,764 | 25,674 | 177,939 | 135,884 | 156,810 | 13,450,462 |
| Other softwoods | 2,732,059 | -- | 132,607 | 263,422 | -- | 44,735 | -- | 91,066 |
| Total | 86,118,219 | 15,662,712 | 18,595,148 | 2,885,074 | 1,444,722 | 678,200 | 723,373 | 19,179,838 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 16,058,543 | 169,752 | 462,512 | 215,694 | -- | -- | -- | -- |
| Select red oaks | 41,062,175 | 1,768,090 | 805,828 | 248,414 | 843 | -- | -- | -- |
| Other red oaks | 10,856,560 | 776,651 | 727,212 | -- | -- | -- | -- | -- |
| Hickory | 144,715 | -- | 28,639 | -- | -- | -- | -- | -- |
| Yellow birch | 2,408,314 | -- | -- | 17,480 | -- | -- | -- | 174,239 |
| Hard maple | 41,820,319 | 6,661 | 93,196 | -- | 25,426 | -- | -- | 32,820 |
| Soft maple | 40,776,684 | 257,554 | 565,038 | 169,617 | 226,993 | 7,879 | 20,014 | 985,365 |
| Beech | 7,637,268 | -- | 23,395 | 13,403 | -- | -- | -- | -- |
| Ash | 15,026,373 | -- | 34,607 | 14,738 | 36,042 | -- | -- | 1,302,124 |
| Balsam poplar | 4,216,178 | -- | -- | -- | 24,967 | 60,503 | 47,750 | 551,776 |
| Cottonwood | 474,245 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 31,578,120 | 160,326 | 381,690 | 140,888 | 13,250 | 8,158 | -- | 178,534 |
| Quaking aspen | 33,711,137 | 455,569 | 468,549 | 256,416 | 392,677 | 91,707 | 39,992 | 663,301 |
| Basswood | 12,614,222 | 23,056 | 26,847 | -- | -- | -- | -- | 71,241 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 9,766 | -- | 9,766 | -- | -- | -- | -- | -- |
| Black cherry | 5,895,848 | 70,864 | 132,929 | 20,808 | 19,848 | -- | 3,143 | 24,045 |
| Butternut | 11,465 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 2,543,500 | 14,966 | -- | 4,387 | 551 | -- | 11,062 | 92,646 |
| Paper birch | 13,246,355 | 15,135 | 39,143 | 95,183 | 389,142 | 3,159 | 36,833 | 1,741,417 |
| Other hardwoods | 879,737 | -- | 8,601 | -- | -- | -- | -- | 21,671 |
| Noncommercial species | 2,341,574 | 7,445 | 32,723 | -- | -- | -- | 4,266 | 21,255 |
| Total | 283,313,098 | 3,726,069 | 3,840,675 | 1,197,028 | 1,129,739 | 171,406 | 163,060 | 5,860,434 |
| All species | 369,431,317 | 19,388,781 | 22,435,823 | 4,082,102 | 2,574,461 | 849,606 | 886,433 | 25,040,272 |

(Table 72 continued on next page)

(Table 72 continued)

| Species group | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|
| | Forest type | | | | | | | |
| SOFTWOODS | | | | | | | | |
| White pine | 35,591 | 745,705 | 322,953 | 1,455,841 | 1,234,316 | 73,325 | 2,741 | 10,152 |
| Red pine | -- | 1,222,624 | 75,887 | 840,627 | 1,458,568 | 84,934 | 197,282 | 8,831 |
| Jack pine | 24,027 | 2,181,664 | 12,957 | 523,549 | 700,350 | -- | 46,112 | 12,043 |
| White spruce | -- | -- | 61,959 | 32,789 | 266,276 | 19,031 | 479 | -- |
| Black spruce | 74,225 | 4,247 | 34,935 | 3,725 | 52,549 | 3,934 | -- | -- |
| Balsam fir | 80,876 | 64,971 | 438,346 | 287,549 | 2,210,445 | 317,691 | -- | 5,230 |
| Hemlock | -- | 24,573 | 231,038 | 2,484,967 | 290,073 | 78,939 | -- | -- |
| Tamarack | 666,285 | 3,760 | 63,734 | 58,671 | 46,376 | 32,087 | -- | 7,380 |
| Northern white-cedar | 109,799 | 13,237 | 1,426,671 | 1,178,960 | 2,365,003 | 433,233 | 2,689 | 2,112 |
| Other softwoods | -- | 19,465 | 3,020 | 84,617 | 63,605 | -- | 2,026,489 | 3,033 |
| Total | 990,803 | 4,280,246 | 2,671,500 | 6,951,295 | 8,687,561 | 1,043,174 | 2,275,792 | 48,781 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 12,844,466 | 234,262 | 932,821 | 1,145,017 | 35,497 | 18,522 | -- |
| Select red oaks | -- | 26,446,283 | 187,664 | 5,187,637 | 6,121,025 | 234,128 | 54,352 | 7,911 |
| Other red oaks | -- | 8,638,251 | 28,130 | 262,804 | 423,512 | -- | -- | -- |
| Hickory | -- | -- | -- | 107,274 | -- | 8,802 | -- | -- |
| Yellow birch | -- | 20,036 | 421,889 | 1,589,908 | 96,100 | 82,731 | 5,931 | -- |
| Hard maple | -- | 248,290 | 296,044 | 39,419,192 | 1,423,599 | 190,742 | 60,365 | 23,984 |
| Soft maple | 38,851 | 4,779,637 | 8,112,015 | 15,022,396 | 9,854,704 | 698,348 | 16,524 | 21,749 |
| Beech | -- | 137,375 | 22,273 | 6,948,624 | 409,221 | 82,977 | -- | -- |
| Ash | 15,260 | 294,189 | 4,823,770 | 6,556,213 | 1,663,241 | 257,487 | 3,817 | 24,885 |
| Balsam poplar | 10,436 | 10,082 | 393,412 | 158,309 | 2,808,593 | 91,501 | 56,773 | 2,076 |
| Cottonwood | -- | 5,107 | 268,894 | 78,477 | 121,767 | -- | -- | -- |
| Bigtooth aspen | -- | 3,978,331 | 243,996 | 4,737,276 | 21,460,049 | 202,301 | 57,125 | 16,196 |
| Quaking aspen | 11,868 | 931,813 | 1,381,896 | 4,968,954 | 23,430,422 | 556,548 | 36,735 | 24,690 |
| Basswood | -- | 112,924 | 486,004 | 11,176,319 | 568,673 | 133,438 | 15,720 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 398,902 | 170,912 | 3,631,446 | 1,270,102 | 26,513 | 19,678 | 106,658 |
| Butternut | -- | 4,416 | -- | 7,049 | -- | -- | -- | -- |
| Elm | -- | 6,975 | 508,750 | 1,578,806 | 270,361 | 41,008 | 5,341 | 8,647 |
| Paper birch | 44,216 | 544,897 | 978,616 | 2,619,534 | 4,144,084 | 2,594,996 | -- | -- |
| Other hardwoods | -- | 235,460 | 245,665 | 221,632 | 139,193 | 7,515 | -- | -- |
| Noncommercial species | -- | 61,441 | 42,705 | 1,656,797 | 451,142 | 39,569 | 7,245 | 16,986 |
| Total | 120,631 | 59,698,875 | 18,846,897 | 106,861,468 | 75,800,805 | 5,284,101 | 358,128 | 253,782 |
| All species | 1,111,434 | 63,979,121 | 21,518,397 | 113,812,763 | 84,488,366 | 6,327,275 | 2,633,920 | 302,563 |

Table 73.--All live tree biomass by species group and tree biomass component, Northern Lower Peninsula, Michigan, 1980

| | | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| Species group | All components | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| | | - - - - - - - - | - - - - - - -Green tons- | - - - - - - - - | - - - - - - - - | - - - - - - - - |
| SOFTWOODS | | | | | | |
| White pine | 7,178,962 | 1,306,735 | 3,937,307 | 1,728,968 | 121,939 | 84,013 |
| Red pine | 21,656,416 | 4,362,086 | 11,642,347 | 5,482,052 | 102,179 | 67,752 |
| Jack pine | 19,415,814 | 4,479,292 | 9,828,555 | 4,328,480 | 468,099 | 311,388 |
| White spruce | 1,411,468 | 247,745 | 774,054 | 366,026 | 13,005 | 10,638 |
| Black spruce | 1,618,318 | 620,904 | 667,597 | 310,754 | 10,558 | 8,505 |
| Balsam fir | 7,062,318 | 2,658,283 | 2,963,401 | 1,366,885 | 41,344 | 32,405 |
| Hemlock | 3,544,701 | 589,788 | 1,912,786 | 828,736 | 132,919 | 80,472 |
| Tamarack | 1,972,926 | 827,396 | 689,433 | 355,356 | 54,994 | 45,747 |
| Northern white-cedar | 19,525,237 | 7,528,357 | 7,159,363 | 3,421,541 | 859,150 | 556,826 |
| Other softwoods | 2,732,059 | 1,447,113 | 734,852 | 326,100 | 139,749 | 84,245 |
| Total | 86,118,219 | 24,067,699 | 40,309,695 | 18,514,898 | 1,943,936 | 1,281,991 |
| HARDWOODS | | | | | | |
| Select white oaks | 16,058,543 | 1,720,883 | 9,076,322 | 4,105,680 | 737,356 | 418,302 |
| Select red oaks | 41,062,175 | 1,959,293 | 25,510,211 | 11,493,568 | 1,316,283 | 782,820 |
| Other red oaks | 10,856,560 | 467,847 | 6,481,741 | 2,886,111 | 640,340 | 380,521 |
| Hickory | 144,715 | 47,580 | 66,958 | 30,177 | -- | -- |
| Yellow birch | 2,408,314 | 304,173 | 1,214,831 | 546,400 | 200,159 | 142,751 |
| Hard maple | 41,820,319 | 8,074,885 | 22,034,852 | 9,922,928 | 1,110,098 | 677,556 |
| Soft maple | 40,776,684 | 8,347,213 | 20,662,624 | 9,826,922 | 1,199,905 | 740,020 |
| Beech | 7,637,268 | 758,906 | 3,701,035 | 1,765,880 | 861,431 | 550,016 |
| Ash | 15,026,373 | 3,640,754 | 7,354,001 | 3,321,567 | 445,278 | 264,773 |
| Balsam poplar | 4,216,178 | 447,917 | 2,402,917 | 1,100,621 | 161,369 | 103,354 |
| Cottonwood | 474,245 | -- | 292,897 | 152,579 | 16,010 | 12,759 |
| Bigtooth aspen | 31,578,120 | 4,617,164 | 17,209,926 | 8,019,904 | 1,025,183 | 705,943 |
| Quaking aspen | 33,711,137 | 7,130,678 | 16,215,642 | 7,851,153 | 1,447,266 | 1,066,398 |
| Basswood | 12,614,222 | 397,204 | 8,205,384 | 3,571,045 | 280,366 | 160,223 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- |
| Black walnut | 9,766 | -- | 6,768 | 2,998 | -- | -- |
| Black cherry | 5,895,848 | 1,065,326 | 2,614,342 | 1,164,970 | 674,420 | 376,790 |
| Butternut | 11,465 | -- | 7,761 | 3,704 | -- | -- |
| Elm | 2,543,500 | 882,186 | 950,203 | 463,485 | 161,187 | 86,439 |
| Paper birch | 13,246,355 | 1,677,544 | 7,254,204 | 3,501,384 | 498,898 | 314,325 |
| Other hardwoods | 879,737 | 275,126 | 315,217 | 155,317 | 81,274 | 52,803 |
| Noncommercial species | 2,341,574 | 1,306,915 | -- | -- | 681,638 | 353,021 |
| Total | 283,313,098 | 43,121,594 | 151,577,836 | 69,886,393 | 11,538,461 | 7,188,814 |
| All species | 369,431,317 | 67,189,293 | 191,887,531 | 88,401,291 | 13,482,397 | 8,470,805 |

(Table 73 continued on next page)

(Table 73 continued)

| Species group | All components | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| | | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| | | - - - - - - - - - - - - -Thousand cubic feet- | - - - - - - - - - - - - | | | |
| SOFTWOODS | | | | | | |
| White pine | 396,800 | 72,295 | 217,605 | 95,556 | 6,717 | 4,627 |
| Red pine | 1,055,580 | 211,495 | 568,168 | 267,536 | 5,038 | 3,343 |
| Jack pine | 815,281 | 186,443 | 413,248 | 181,995 | 20,164 | 13,431 |
| White spruce | 80,079 | 14,037 | 43,933 | 20,775 | 734 | 600 |
| Black spruce | 99,078 | 37,918 | 40,947 | 19,060 | 639 | 514 |
| Balsam fir | 322,259 | 121,383 | 135,125 | 62,328 | 1,918 | 1,505 |
| Hemlock | 149,206 | 24,549 | 80,570 | 34,909 | 5,712 | 3,466 |
| Tamarack | 86,332 | 36,369 | 30,025 | 15,479 | 2,431 | 2,028 |
| Northern white-cedar | 1,335,910 | 513,006 | 491,859 | 235,062 | 58,280 | 37,703 |
| Other softwoods | 130,366 | 68,766 | 35,173 | 15,614 | 6,745 | 4,068 |
| Total | 4,470,891 | 1,286,261 | 2,056,653 | 948,314 | 108,378 | 71,285 |
| HARDWOODS | | | | | | |
| Select white oaks | 566,801 | 59,086 | 320,909 | 145,173 | 26,545 | 15,088 |
| Select red oaks | 1,435,654 | 67,272 | 891,459 | 401,752 | 47,078 | 28,093 |
| Other red oaks | 375,510 | 15,833 | 223,745 | 99,659 | 22,735 | 13,538 |
| Hickory | 4,988 | 1,610 | 2,328 | 1,050 | -- | -- |
| Yellow birch | 90,255 | 11,266 | 45,340 | 20,393 | 7,723 | 5,533 |
| Hard maple | 1,584,077 | 303,853 | 835,216 | 376,120 | 42,744 | 26,144 |
| Soft maple | 1,764,871 | 360,182 | 894,415 | 425,465 | 52,412 | 32,397 |
| Beech | 298,124 | 29,501 | 144,145 | 68,774 | 33,976 | 21,728 |
| Ash | 623,985 | 147,479 | 307,792 | 139,047 | 18,589 | 11,078 |
| Balsam poplar | 213,955 | 22,651 | 121,935 | 55,856 | 8,235 | 5,278 |
| Cottonwood | 20,276 | -- | 12,504 | 6,512 | 700 | 560 |
| Bigtooth aspen | 1,511,790 | 219,343 | 824,271 | 384,153 | 49,738 | 34,285 |
| Quaking aspen | 1,609,456 | 338,750 | 774,206 | 374,890 | 69,980 | 51,630 |
| Basswood | 627,834 | 19,664 | 408,380 | 177,734 | 14,030 | 8,026 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- |
| Black walnut | 364 | -- | 252 | 112 | -- | -- |
| Black cherry | 267,088 | 47,719 | 118,430 | 52,779 | 30,882 | 17,278 |
| Butternut | 520 | -- | 352 | 168 | -- | -- |
| Elm | 99,966 | 34,293 | 37,525 | 18,307 | 6,404 | 3,437 |
| Paper birch | 551,619 | 69,825 | 301,836 | 145,708 | 20,993 | 13,257 |
| Other hardwoods | 36,989 | 11,452 | 13,244 | 6,530 | 3,488 | 2,275 |
| Noncommercial species | 98,531 | 54,398 | -- | -- | 29,062 | 15,071 |
| Total | 11,782,653 | 1,814,177 | 6,278,284 | 2,900,182 | 485,314 | 304,696 |
| All species | 16,253,544 | 3,100,438 | 8,334,937 | 3,848,496 | 593,692 | 375,981 |

Table 74.--Sampling errors[1] for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land, Northern Lower Peninsula, Michigan, 1980

| Sampling error | Commercial forest area | Growing Stock | | | Sawtimber | | |
|---|---|---|---|---|---|---|---|
| | | Inventory | Growth | Removals | Inventory | Growth | Removals |
| Percent | Thousand acres | - - - -Million cubic feet- - - - | | | - - -[2]/Million board feet- - - - | | |
| 1 | 1,892.6 | 10,035.2 | 732.3 | 18,764.0 | 54,695.2 | 7,489.2 | 78,153.3 |
| 2 | 473.1 | 2,508.8 | 183.1 | 4,691.0 | 13,673.8 | 1,872.3 | 19,538.3 |
| 3 | 210.3 | 1,115.0 | 81.4 | 2,084.9 | 6,077.2 | 832.1 | 8,683.7 |
| 4 | 118.3 | 627.2 | 45.8 | 1,172.8 | 3,418.5 | 468.1 | 4,884.6 |
| 5 | 75.7 | 401.4 | 29.3 | 750.6 | 2,187.8 | 299.6 | 3,126.1 |
| 10 | 18.9 | 100.4 | 7.3 | 187.6 | 547.0 | 74.9 | 781.5 |
| 15 | 8.4 | 44.6 | 3.3 | 83.4 | 243.1 | 33.3 | 347.3 |
| 20 | 4.7 | 25.1 | 1.8 | 46.9 | 136.7 | 18.7 | 195.4 |
| 25 | 3.0 | 16.1 | 1.2 | 30.0 | 87.5 | 12.0 | 125.0 |
| 50 | 0.8 | 4.0 | 0.3 | 7.5 | 21.9 | 3.0 | 31.3 |
| 100 | 0.2 | 1.0 | 0.1 | 1.9 | 5.5 | 0.7 | 7.8 |

[1] At the 68-percent probability level.

[2] International 1/4-inch rule.

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The fourth inventory of the timber resource of Michigan's Northern Lower Peninsula Survey Unit shows a 4-percent decline in commercial forest area and a 38 percent gain in growing-stock volume between 1966 and 1980. Presented are highlights and statistics on area, volume, growth, mortality, removals, utilization, and biomass.

KEY WORDS: Timber resource, statistics, area, volume, growth, mortality, removals.

**United States
Department of
Agriculture**

Forest
Service

North Central
Forest Experiment
Station

Resource
Bulletin **NC-63**

# A Net Volume Equation for Indiana

W. Brad Smith and Carol A. Weist

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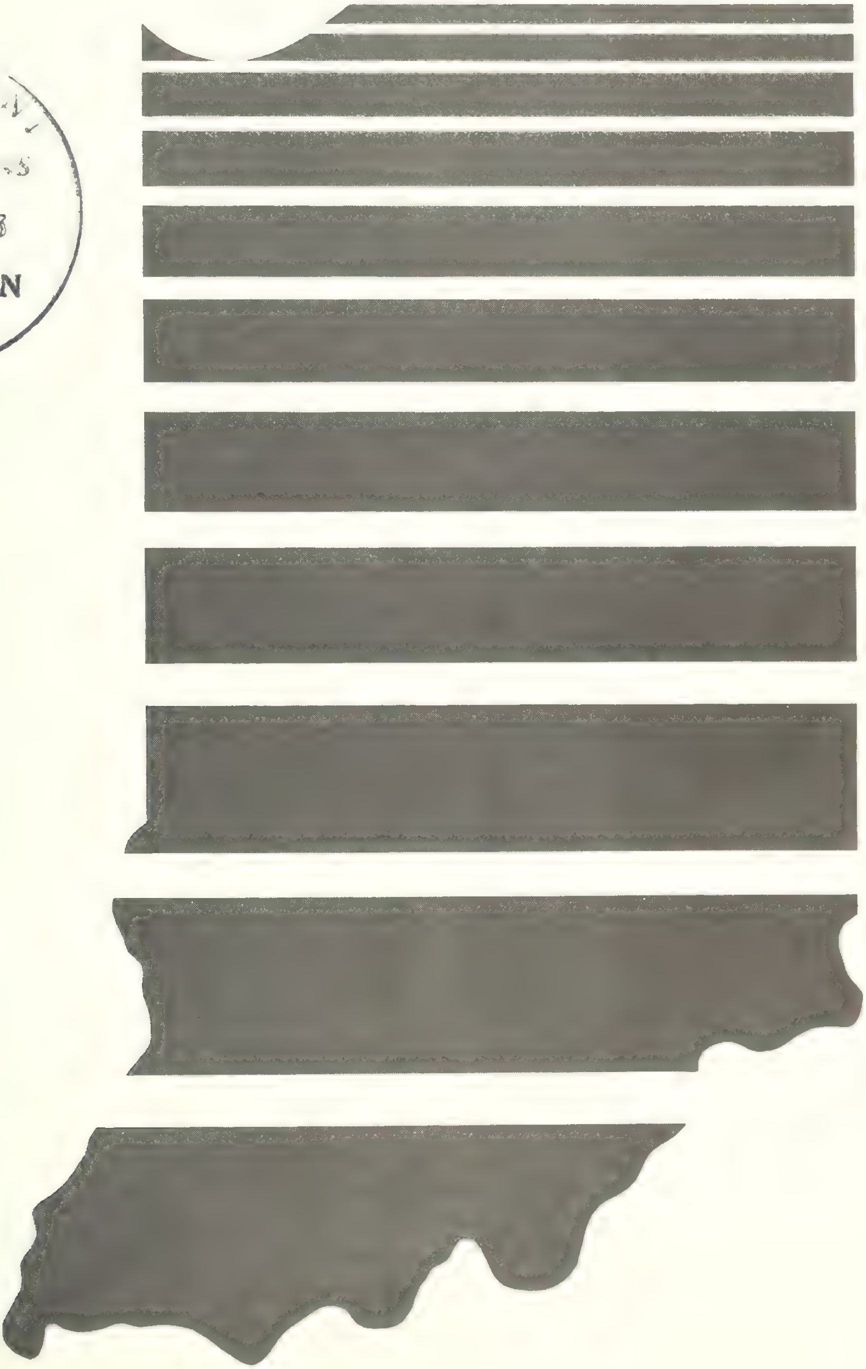

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1992 Folwell Avenue
St. Paul, Minnesota 55108
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# A NET VOLUME EQUATION FOR INDIANA

**W. Brad Smith**, *Mensurationist,*
*and* **Carol A. Weist**, *Computer Programmer*

Recent development of computerized forest growth models has increased the need for accurate tree volume equations. The Stand and Tree Evaluation and Modeling System (STEMS)[1], recently calibrated for the Central States, is a computerized distance independent tree growth model. The volume equation and coefficients presented in this report will form the basis of tree volume estimates for STEMS in the eastern Central States. The equation and coefficients will also be used to estimate tree volumes in the next Indiana forest inventory to be conducted by North Central Forest Experiment Station. The equation is suitable for use on digital computers by foresters, land managers, researchers, and others in need of net volume-per-tree estimates for large forest areas. Both board foot and cubic foot volume can be estimated for most tree classes and species.

## HOW THE EQUATION AND COEFFICIENTS WERE DEVELOPED

Based on Gevorkiantz and Olsen's (1955) composite volume tables for the Lake States, we used equations developed by Robert N. Stone (Appendix) to estimate the cubic foot and board foot volume in each tree. Stone's equations compute gross volume in a tree from three measurements—diameter breast height (d.b.h.), merchantable height, and top diameter outside bark (t.d.o.b.). This estimated volume was then corrected for differences in bark thickness between species and a field estimate of cull volume was subtracted to arrive at net volume.

The equation form selected for the volume regressions was a modified Weibull. It has been demonstrated that Weibull-type functions offer the wide ange of flexibility necessary to accommodate a diverse set of biologically sound curve forms (Yang *et al.* 1978). The following equation form was selected for the Indiana regression:

$$V = A \cdot SI^{B} \left[ 1 - e^{-C \cdot DBH^{D}} \right]$$

Where the dependent variable V is net volume of the tree, and the independent variables SI and DBH are tree site index and diameter at breast height, respectively. The value of e is the constant base of natural logarithm (2.71828). A, B, C, and D are the equation coefficients. The upper asympote, $A \cdot SI^{B}$, is a function of site index. The C and D parameters are the basis of Weibull curve flexibility and are determinants of scale and shape, respectively. An example of this function can be seen graphically in fig. 1.

The equation coefficients were developed using field data collected on 12,162 trees in Indiana during the 1967 inventory. Data included d.b.h., merchantable height, t.d.o.b., site index, and tree class. For sawtimber-size trees, measurements were taken at both the sawtimber and poletimber limits of merchantability.[2] Field crews also estimated the volume of board foot and cubic foot cull in each tree (USDA Forest Service 1964).

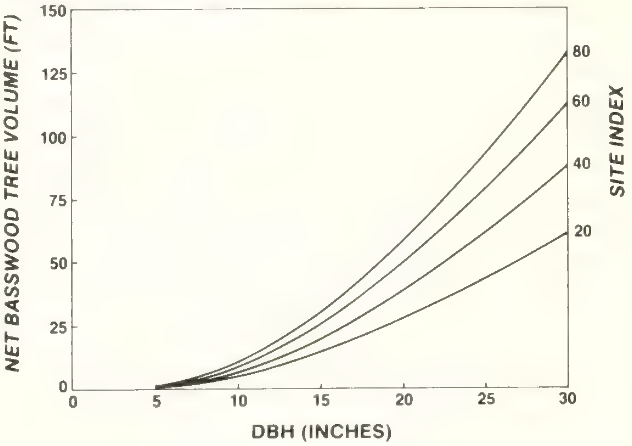

Figure 1.—*Net cubic foot volume of desirable and acceptable basswood trees by DBH and selected site index levels.*

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[1] *For more information on STEMS, see: Belcher, D. L.; Holdaway M. R.; Brand G. J. A Description of STEMS: The stand and tree evaluation and modeling system. Gen. Tech. Rep. NC-79. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; (in prep.)*

[2] *The poletimber merchantability limits include trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum of 4.0-inch t.d.o.b., or to the point where the central stem breaks into limbs. Dimensions for sawtimber are 9.0-inch d.b.h. to a minimum 7-inch t.d.o.b. for softwoods and 11.0-inch d.b.h. to a minimum 9.0-inch t.d.o.b. for hardwoods.*

Cubic foot and board foot equation coefficients were developed for each of three tree class categories: "desirable and acceptable", "rough and short-log", and "rotten" (See Appendix). The groupings of species for the equations were primarily determined by the number of observations and the similarity of bole form among species. Species for which no observations were available were assigned equations on the basis of bole form. (See Appendix for species and species groups).

A computerized nonlinear regression program (Marquardt method) was used to fit the above equation to the tree data. The resulting coefficients and statistics for each regression are given in tables 1-3 (Appendix).

Because the average site index may be used when site index is unknown, the only other data needed to determine tree volumes using this model are species, d.b.h., and tree class. The average site index for Indiana species based on USDA Forest Service inventory data is found in tables 1-3 (Appendix). Note that net volume per tree varies greatly, therefore, these equations should be applied to an adequate sample over a large forest area.

## HOW TO USE THE EQUATION

1. Select the appropriate species group and coefficients from tables 1-3.
2. Substitute these coefficients in the above equation.
3. Solve the equation to obtain net volume.

For example, to compute the cubic foot volume of a 15-inch acceptable basswood tree with a site index of 60 we would first obtain the coefficients for basswood from table 1. Substituting into the general net volume equation:

$$V = A \cdot SI^{B}\left[1.0 - e^{-C \cdot DBH^{D}}\right]$$

$$V = 16.882\ (60.0)^{.572}\left[1.0 - e^{-.0001(15.0)^{2.707}}\right]$$

$$V = (16.882) \cdot (10.402) \cdot (1.0 - .859)$$

$$V = 24.85 \text{ cubic feet}$$

This volume may be verified graphically in figure 1.

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# APPENDIX

## VOLUME EQUATIONS

Stone uses the following dependent variables in his equation to estimate cubic foot volume (cv): diameter at breast height (D), merchantable height (H), and diameter outside bark at merchantable height (T).

$$CV = (3.0086 \text{ X } 10^{-3} + S1 + S2 + S3 + S4 + S5 + S6 + S7 + S8) \cdot 79.0$$

where

$S1 = (2.0355 \text{ X } 10^{-3})D$,
$S2 = (-3.0018 \text{ X } 10^{-3})T$,
$S3 = (6.2381 \text{ X } 10^{-5})D^{2}$,
$S4 = (2.5705 \text{ X } 10^{-5})D^{2} \cdot H$,
$S5 = (-7.0090 \text{ X } 10^{-6})H^{2}$,
$S6 = (3.6708 \text{ X } 10^{-5})H \cdot T^{2}$,
$S7 = (8.1400 \text{ X } 10^{-10})D^{2} \cdot H^{3}$, and
$S8 = (-1.90000 \text{ X } 10^{-9})D^{2} \cdot H^{2} \cdot T$.

Stone's board foot volume equation as modified by Hahn (1975, 1976) is as follows:

$$BV = 17.7488 + 7.3846 \cdot CV - 2.3523 \cdot D - .89945 \cdot H + 2.0726 \cdot T$$

where

BV = board foot volume (International 1/4-inch rule).

## DEFINITION OF TERMS

**Desirable trees.**—Live trees that have no serious defects limiting present or prospective use, have relatively high vigor, and have no visible signs of pathogens that may result in death or serious deterioration before rotation age. They would be favored by forest managers in silvicultural operations.

**Acceptable trees.**—Live trees that have no serious defects limit present or prospective use but that have pathogens or damage affecting quality.

**Rough trees.**—Live trees that do not contain at least one merchantable 12-foot log, now or prospectively, because of roughness, poor form, or noncommercial species.

**Rotten trees.**—"Rough" trees in which more than 50 percent of the cull volume is rotten.

**Short-log trees.**—Live sawtimber sized trees that contain at least one merchantable from 8- to 11-foot saw log but not a 12-foot saw log, now or prospectively.

## PRINCIPAL TREE SPECIES OF INDIANA[3]

SOFTWOOD SPECIES

| | |
|---|---|
| Pines | |
| Shortleaf pine | *Pinus echinata* |
| Virginia pine | *Pinus virginiana* |
| Red pine | *Pinus resinosa* |
| White pine | *Pinus strobus* |
| Scotch pine | *Pinus sylvestris* |
| Other softwoods | |
| Eastern redcedar | *Juniperus virginiana* |
| Tamarack | *Larix laricina* |
| Baldcypress | *Taxodium distichum* |

HARDWOOD SPECIES

| | |
|---|---|
| White oaks | |
| White oak | *Quercus alba* |
| Swamp white oak | *Quercus bicolor* |
| Bur oak | *Quercus macrocarpa* |
| Swamp chestnut oak | *Quercus michauxii* |
| Chinkapin oak | *Quercus muehlenbergii* |
| Chestnut oak | *Quercus pinus* |
| Post oak | *Quercus stellata* |
| Red oaks | |
| Northern red oak | *Quercus rubra* |
| Cherrybark oak | *Quercus falcata* var. *pagodaefolia* |
| Shumard oak | *Quercus shumardii* |
| Black oak | *Quercus velutina* |
| Scarlet oak | *Quercus coccinea* |
| Southern red oak | *Quercus falcata* |
| Shingle oak | *Quercus imbricaria* |
| Pin oak | *Quercus palustris* |
| Hickories | |
| Mockernut hickory | *Carya tomentosa* |
| Shagbark hickory | *Carya ovata* |
| Shellbark hickory | *Carya laciniosa* |
| Pecan | *Carya illinoensis* |
| Pignut hickory | *Carya glabra* |
| Bitternut hickory | *Carya cordiformis* |
| Hard maple | *Acer saccharum* |
| Soft maples | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| Boxelder | *Acer negundo* |
| Beech | *Fagus grandifolia* |
| Sweetgum | *Liquidambar styraciflua* |
| Blackgum | *Nyssa sylvatica* var. *biflora* |
| Ashes | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Blue ash | *Fraxinus quadrangulata* |
| Cottonwood | *Populus deltoides* |
| Aspens | |
| Balsam poplar | *Populus balsamifera* |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| Basswood | *Tilia americana* |
| Yellow-poplar | *Liriodendron tulipifera* |
| Walnuts | |
| Black walnut | *Juglans nigra* |
| Butternut | *Juglans cinerea* |
| Black cherry | *Prunus serotina* |

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[3] *The common and scientific names are based on: Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handbk. 541. Washington, D.C.: U.S. Department of Agriculture, Forest Service; 1979. 375 p.*

| | |
|---|---|
| Elms | |
| Winged elm | *Ulmus alata* |
| American elm | *Ulmus americana* |
| Siberian elm | *Ulmus pumila* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomasii* |
| Sycamore | *Platanus occidentalis* |
| Other hardwoods | |
| Yellow birch | *Betula alleghaniensis* |
| River birch | *Betula nigra* |
| Paper birch | *Betula papyrifera* |
| Ohio buckeye | *Aesculus glabra* |
| Hackberry | *Celtis occidentalis* |
| Northern catalpa | *Catalpa speciosa* |
| Flowering dogwood | *Cornus florida* |
| Common persimmon | *Diospyros virginiana* |
| Honeylocust | *Gleditsia triacanthos* |
| Kentucky coffeetree | *Gymnocladus dioicus* |
| Osage-orange | *Maclura pomifera* |
| Cucumbertree | *Magnolia acuminata* |
| Black locust | *Robinia pseudoacacia* |
| Black willow | *Salix nigra* |
| Sassafras | *Sassafras albidum* |

# METRIC EQUIVALENTS

1,000 board feet (International 1/4-inch log rule) = 3.48 cubic meters.

Breast Height = 1.37 meters above the ground .1 cubic foot = 0.0283 cubic meter.

1 foot = 30.48 centimeters or 0.3048 meter.

1 inch = 25.4 millimeters or 2.54 centimeters or 0.0254 meter.

Table 1.--Net cubic foot volume regression coefficients by tree class and species group[1/], Indiana, 1982

| Species group | Coefficient |  |  |  | Average | D.b.h. |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  | A | B | C | D | site index | Range | Average | Observations | Standard error |
|  |  |  |  |  |  |  |  | Number | Cubic feet |
| DESIRABLE AND ACCEPTABLE TREES |  |  |  |  |  |  |  |  |  |
| Pines | 32.7134 | 0.3785 | 0.000089 | 2.7986 | 72 | 5-19 | 8 | 94 | 0.4 |
| Other softwoods | 24.3201 | .8216 | .000044 | 2.5616 | 65 | 5-44 | 14 | 101 | .7 |
| White oaks | 21.1498 | .5754 | .000110 | 2.5942 | 66 | 5-45 | 14 | 2,281 | .4 |
| Red oaks | 126.1555 | .2152 | .000081 | 2.5973 | 71 | 5-44 | 15 | 2,305 | .5 |
| Hickories | 24.3795 | .5106 | .000086 | 2.7597 | 69 | 5-34 | 11 | 1,576 | .4 |
| Basswood | 16.8823 | .5723 | .000100 | 2.7071 | 72 | 5-30 | 14 | 119 | .4 |
| Beech | 252.1400 | .0336 | .000110 | 2.5349 | 79 | 5-33 | 16 | 427 | .6 |
| Hard and soft maples | 948.9211 | 0 | .000059 | 2.3163 | 70 | 5-45 | 12 | 1,436 | .4 |
| Elms | 341.7616 | 0 | .000083 | 2.5673 | 75 | 5-27 | 11 | 375 | .3 |
| Ashes | 168.5280 | .0904 | .000099 | 2.6121 | 76 | 5-32 | 11 | 761 | .3 |
| Sycamore | 30.7110 | .5829 | .000073 | 2.6184 | 80 | 5-38 | 16 | 398 | .6 |
| Cottonwood-willow | 14.1604 | .8812 | .000056 | 2.4651 | 80 | 5-43 | 16 | 254 | .6 |
| Aspen-birch | 32.0897 | .4262 | .000177 | 2.4820 | 84 | 5-29 | 11 | 123 | .3 |
| Sweetgum | 12.3238 | .5555 | .000115 | 2.8126 | 83 | 5-29 | 12 | 180 | .3 |
| Blackgum | 15.8460 | .5938 | .000063 | 2.8574 | 76 | 5-28 | 13 | 125 | .4 |
| Black cherry | 21.9481 | .4170 | .000263 | 2.5539 | 75 | 5-25 | 11 | 195 | .3 |
| Walnuts | 65.4786 | .0383 | .000265 | 2.7537 | 78 | 5-22 | 11 | 314 | .3 |
| Yellow poplar | 23.6994 | .5052 | .000097 | 2.7495 | 79 | 5-35 | 14 | 582 | .5 |
| Other hardwoods | 16.7211 | .5991 | .000080 | 2.7109 | 77 | 5-37 | 10 | 516 | .3 |
| ROUGH AND SHORT-LOG TREES |  |  |  |  |  |  |  |  |  |
| Softwoods | 22.7769 | .4240 | .000057 | 2.9092 | 70 | 5-20 | 9 | 37 | .2 |
| White oaks | 104.1617 | .0890 | .000119 | 2.5916 | 65 | 5-41 | 18 | 221 | .6 |
| Red oaks | 21.1882 | .6788 | .000073 | 2.4026 | 70 | 5-46 | 16 | 204 | .5 |
| Hickories | 18.6983 | .4097 | .000132 | 2.7085 | 70 | 5-27 | 13 | 113 | .3 |
| Beech | 4.0681 | .5642 | .000099 | 3.2936 | 82 | 5-30 | 13 | 78 | .4 |
| Hard and soft maples | 72.0477 | .0743 | .000166 | 2.7068 | 70 | 5-40 | 14 | 244 | .4 |
| Elms | 25.5502 | .1927 | .000200 | 2.7686 | 73 | 5-27 | 10 | 122 | .2 |
| Ashes | 5.0944 | .6960 | .000158 | 2.6118 | 75 | 5-32 | 12 | 111 | .3 |
| Sycamore | 33.2901 | .4860 | .000050 | 2.7414 | 77 | 5-34 | 15 | 44 | .4 |
| Cottonwood-willow | 62.0266 | .4397 | .000037 | 2.6637 | 72 | 5-30 | 14 | 49 | .4 |
| Black cherry | 8.9688 | .3930 | .000253 | 2.8160 | 72 | 5-27 | 10 | 72 | .3 |
| Other hardwoods | 57.1662 | .4545 | .000048 | 2.5027 | 76 | 5-47 | 10 | 234 | .3 |
| Noncommercial species | 42.6350 | 0 | .000454 | 2.5315 | 75 | 5-23 | 8 | 68 | .2 |
| ROTTEN TREES |  |  |  |  |  |  |  |  |  |
| All species | 13.5690 | .7493 | .000054 | 2.4058 | 73 | 5-62 | 19 | 524 | 1.0 |

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[1/] See Appendix III for individual species within major groups.

Table 2.--Net board foot[1/] saw log volume regression coefficients by tree class and species group[2/], Indiana, 1982

| Species group | Coefficient | | | | Average | D.b.h. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | site index | Range | Average | Observations | Standard error |
| | | | | | | | | Number | Board feet |
| DESIRABLE AND ACCEPTABLE TREES | | | | | | | | | |
| Pines | 68.6528 | 0.9374 | 0.000040 | 2.6643 | 69 | 10-38 | 17 | 94 | 3.2 |
| Other softwoods | 68.6358 | .6359 | .000082 | 2.8486 | 71 | 11-25 | 16 | 48 | 2.8 |
| White oaks | 103.7664 | .6707 | .000076 | 2.6670 | 73 | 11-44 | 16 | 1,485 | 3.6 |
| Red oaks | 871.4258 | .0682 | .000112 | 2.5879 | 68 | 11-45 | 18 | 1,686 | 3.0 |
| Hickories | 1,151.2737 | 0 | .000077 | 2.7331 | 71 | 11-44 | 18 | 745 | 3.2 |
| Basswood | 68.6283 | .6229 | .000045 | 3.0375 | 71 | 11-26 | 16 | 75 | 3.0 |
| Beech | 343.5727 | .3245 | .000081 | 2.6745 | 69 | 11-33 | 15 | 326 | 2.7 |
| Hard and soft maples | 68.6272 | .5665 | .000140 | 2.7006 | 74 | 11-34 | 17 | 747 | 3.5 |
| Elms | 693.5429 | .0476 | .000071 | 2.9203 | 68 | 11-40 | 16 | 138 | 2.4 |
| Ashes | 68.6341 | .7813 | .000079 | 2.5203 | 73 | 11-45 | 18 | 348 | 3.6 |
| Sycamore | 68.6398 | .4570 | .000112 | 2.9491 | 77 | 11-27 | 15 | 272 | 2.6 |
| Cottonwood | 68.6298 | .6536 | .000053 | 2.8696 | 79 | 11-33 | 17 | 182 | 4.2 |
| Aspen-birch | 68.6338 | .6326 | .000067 | 2.8446 | 80 | 11-35 | 21 | 49 | 5.2 |
| Sweetgum | 68.6313 | .8876 | .000052 | 2.4993 | 82 | 11-43 | 21 | 89 | 3.7 |
| Blackgum | 178.1367 | .3166 | .000083 | 2.8811 | 79 | 11-31 | 17 | 75 | 2.3 |
| Black cherry | 68.6298 | .5869 | .000045 | 3.0054 | 81 | 11-37 | 16 | 84 | 2.9 |
| Walnut | 68.6472 | .5722 | .000087 | 2.8488 | 75 | 11-28 | 15 | 155 | 2.9 |
| Yellow poplar | 261.7747 | .3820 | .000088 | 2.6472 | 79 | 11-35 | 16 | 392 | 3.3 |
| Other hardwoods | 164.5671 | .4052 | .000061 | 2.8766 | 77 | 11-35 | 16 | 160 | 2.7 |
| SHORT-LOG TREES | | | | | | | | | |
| All species | 1,454.7622 | 0 | .000133 | 2.2236 | 68 | 11-41 | 19 | 524 | .8 |

---

[1/] International 1/4-inch rule.

[2/] See Appendix III for individual species within major groups.

Table 3.--Net cubic foot saw log volume regression coefficients by tree class and species group[1], Indiana, 1982

| Species group name | Coefficient | | | | Average | D.b.h. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | site index | Range | Average | Observations | Standard error |
| | | | | | | | | Number | Cubic feet |
| DESIRABLE AND ACCEPTABLE TREES | | | | | | | | | |
| Pines | 8.5339 | 0.5167 | 0.000231 | 2.7641 | 69 | 10-38 | 17 | 270 | 0.2 |
| Other softwoods | 32.7134 | .3785 | .000089 | 2.7986 | 71 | 11-25 | 16 | 48 | .4 |
| White oaks | 32.6541 | .4767 | .000084 | 2.6689 | 73 | 11-44 | 16 | 1,485 | .5 |
| Red oaks | 108.1743 | .0818 | .000175 | 2.4623 | 68 | 11-45 | 18 | 1,686 | .5 |
| Hickories | 142.5035 | .0034 | .000116 | 2.6411 | 71 | 11-44 | 18 | 745 | .5 |
| Basswood | 34.0091 | .2952 | .000025 | 3.2982 | 71 | 11-26 | 16 | 75 | .5 |
| Beech | 1,173.2462 | 0 | .000025 | 2.4259 | 69 | 11-33 | 15 | 326 | .4 |
| Hard and soft maples | 190.0165 | 0 | .000199 | 2.3569 | 74 | 11-34 | 17 | 747 | .5 |
| Elms | 77.4351 | .0922 | .000154 | 2.6564 | 63 | 11-40 | 16 | 138 | .4 |
| Ashes | 527.1757 | 0 | .000078 | 2.2867 | 73 | 11-45 | 18 | 348 | .5 |
| Sycamore | 43.4212 | .1437 | .000141 | 2.8151 | 77 | 11-27 | 15 | 272 | .4 |
| Cottonwood | 75.3457 | .4188 | .000016 | 2.8728 | 79 | 11-30 | 17 | 182 | .6 |
| Aspen-birch | 51.9064 | .4039 | .000064 | 2.5744 | 80 | 11-35 | 21 | 49 | .5 |
| Sweetgum | 65.2252 | .4613 | .000060 | 2.4471 | 82 | 11-43 | 21 | 89 | .5 |
| Blackgum | 4.0386 | .6312 | .000064 | 3.1986 | 79 | 11-31 | 17 | 75 | .4 |
| Black cherry | 50.0470 | .2127 | .000064 | 2.8882 | 81 | 11-37 | 16 | 84 | .5 |
| Walnuts | 528.3431 | .1433 | .000030 | 2.4206 | 75 | 11-28 | 15 | 155 | .4 |
| Yellow poplar | 26.6412 | .4204 | .000135 | 2.5659 | 79 | 11-35 | 16 | 392 | .5 |
| Other hardwoods | 15.0211 | .4755 | .000087 | 2.8131 | 77 | 11-35 | 16 | 160 | .4 |
| SHORT-LOG TREES | | | | | | | | | |
| All species | 2.3840 | .6855 | .000083 | 2.7726 | 68 | 11-41 | 19 | 524 | .4 |

[1] See Appendix III for individual species within major groups.

Smith, W. Brad; Weist, Carol A.
A net volume equation for Indiana. Res. Bull. NC-63. St. Paul, MN: U.S. Department Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 7 p.

Describes a Weibull-type volume equation for Indiana developed as part of the ongoing Resource Evaluation research in the Central States. Equation coefficients are presented by species groupings for both cubic foot and board foot volumes for three tree class categories.

KEY WORDS: Inventory, computer, growing-stock, cull, cubic foot, board foot, Weibull.

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North Central Forest Experiment Station

Resource Bulletin NC-64

# Timber Resource of Michigan's Eastern Upper Peninsula, 1980

W. Brad Smith

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Information contained in this report includes the most commonly used Resources Evaluation statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complex retrieval involving the services of a Resources Evaluation computer programmer. Requests for data that conflict with ongoing Resources Evaluation work will be scheduled to minimize their impact on the work unit.

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North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
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1982

# FOREWORD

Resources Evaluation (formerly called Forest Survey) is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Resources Evaluation work done in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1980 Eastern Upper Peninsula forest inventory began in January 1978 and was completed in July 1980. Reports on the three previous surveys of Michigan's timber resource are dated 1935, 1955, and 1966. Similar Resource Bulletins reporting statistical highlights and detailed tables on the other Survey Units in Michigan (see cover) are or soon will be available. In addition to these statistical reports, a series of reports will be published that will analyze the State's timber resources.

More accurate survey information was obtained during the 1980 survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding and manpower provided the North Central Station through the Michigan Department of Natural Resources and by interested forest industry members. Data from the Department's canvass of all primary wood-using plants in the State was used to help estimate the quantity of timber products harvested in Michigan.

Aerial photos used in the Eastern Upper Peninsula Forest Inventory were furnished by the Michigan Department of Natural Resources.

# CONTENTS

Page

Highlights ........................................ 1
Appendix ........................................ 3
  Accuracy of Survey ........................................ 3
  Survey Procedures ........................................ 3
  Comparing Michigan's Fourth Inventory with the Third Inventory ........................ 4
  Log Grade ........................................ 5
  Tree Species Groups in Michigan's Eastern Upper Peninsula Unit .................... 9
  Metric Equivalents of Units Used in this Report ...... 9
  Definition of Terms ........................................ 9
  Tables ........................................ 18

# TIMBER RESOURCE OF MICHIGAN'S EASTERN UPPER PENINSULA, 1980

**W. Brad Smith**
*Mensurationist*

## HIGHLIGHTS

### Forest Area

- Forest land accounted for 4.0 million acres (81 percent of the Unit's land area) in 1980 compared to 4.3 million acres (85 percent) in 1966.
- Commercial forest land occupied 3.8 million acres (95 percent of the forest land) in 1980 compared to 4.2 million acres (97 percent) in 1966—a 9 percent decline.
- Productive-reserved forest land totaled 128,000 acres in 1980 compared to 33,000 acres in 1966.
- Chippewa County contained the largest area of commercial forest in 1980 (706,000 acres) as it did in 1966 (766,000 acres).
- Nonindustrial private parties owned 1.4 million acres (37 percent of the commercial forest) in 1980 compared to 1.5 million acres (36 percent) in 1966.
- The maple-birch forest type continues to dominate the commercial forest, representing 31 percent of the total in 1980 compared to 29 percent in 1966.
- Thirty-six percent of the privately owned commercial forest has been owned by its present owner 20 years or more.
- Poletimber stands occupied 48 percent of the commercial forest in 1980 as compared to 43 percent in 1966.
- Sawtimber stands—the area of which declined by 33,000 acres between surveys—amounted to 26 percent of the commercial forest in 1980 compared to 25 percent in 1966.

### Timber Volume

- The volume of growing stock in 1980 was 4.0 billion cubic feet, 19 percent greater than the 3.4 billion[1] in 1966, in spite of the 9 percent loss of commercial forest land between surveys.
- Sawtimber volume amounted to 9.4 billion board feet[2] in 1980.
- Softwoods make up 43 percent of the growing-stock volume.
- Northern white-cedar (585 million cubic feet), sugar maple (574 million cubic feet), red maple (524 million), and quaking aspen (409 million) contain the highest volumes and together account for more than half of the growing-stock volume.
- Average growing-stock volume per acre in 1980 was 1,061 cubic feet (13.4 cords) compared to 816 cubic feet (10.3 cords) in 1966.
- Thirty-nine percent of the growing-stock volume is in the northern hardwoods forest type.
- Nearly half of the growing stock volume is on public land.
- The volume in cull trees (rough, rotten, and short-log cull) is 332 million cubic feet; salvable dead tree volume is 167 million cubic feet.

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[1] *Published 1966 volumes were adjusted by factors derived from 1980 volume equations for the two inventories comparable.*

[2] *International 1/4-inch rule.*

## Stand Conditions

- Net annual growth on growing-stock trees was 132 million cubic feet in 1979 compared to 101 million in 1965.
- The net annual growth rate of growing stock was 3.3 percent of inventory in 1979 compared to 3.0 percent in 1965.
- Net growth averaged 34.8 cubic feet per acre in 1979—24.3 cubic feet per acre in 1965.
- Annual mortality of growing stock amounted to 41 million cubic feet (1.0 percent of inventory) in 1979, compared to 32 million (0.9 percent of inventory) in 1965.
- Disease accounted for 36 percent of the mortality in 1979—chiefly diseases of aspen and elm.
- Fifty-nine percent of the commercial area is capable of growing trees 51 feet and taller at age 50, and 13 percent of the area can grow trees 71 feet and taller at the same age.
- Stands aged 50 years or less declined from 59 percent of the commercial area in 1966 to 49 percent in 1980.

## Timber Use

- Timber removals from growing stock in 1979 amounted to 54 million cubic feet (1.4 percent of inventory) compared to 48 million cubic feet (1.4 percent of inventory) in 1965.
- Alger County accounted for 20 percent of the 1979 removals, followed by Menominee County (18 percent) and Luce County (17 percent).
- The maples made up 30 percent of the 1979 removals volume, with soft maple removals increasing 267 percent since 1965.
- Output of timber products totaled 50 million cubic feet in 1978, 61 percent of which was pulpwood.
- In 1978, 86 percent of the 6.9 million cubic feet of wood residue from primary plants was used.

## Biomass

- Live shrub biomass (including trees less than 1 inch d.b.h.) was highest in the tamarack forest type where it amounted to 2.0 tons per acre (green weight) in 1980.
- Live tree biomass (trees greater than 1 inch d.b.h.) totaled 220 million green tons (an average of 58 tons per acre) in 1980.
- Highest yields of live tree biomass (green weight) are in the exotic forest type (85 tons per acre), the maple-birch type (76 tons), the northern white cedar type (62 tons), and the white spruce type (58 tons).

# APPENDIX

## Accuracy of Survey

Resources Evaluation information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are only estimates. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the Eastern Upper Peninsula Unit in 1980, 4,034.7 million cubic feet, has a sampling error of ± 1.39 percent (± 56.1 million cubic feet). The growing-stock volume from a 100-percent inventory, then, would be expected to fall between 4,090.8 and 3,978.6 million cubic feet (4,034.7 ± 56.1), there being a one in three chance that this is not the case.

The following tabulation shows the combined sampling errors for the 1980 Eastern Upper Peninsula Forest Inventory:

| Item | Unit totals | Sampling error |
|---|---|---|
| Growing stock | (Million cubic feet) | (Percent) |
| Volume | 4,034.7 | 1.39 |
| Growth | 132.2 | 2.68 |
| Removals | 54.5 | 13.50 |
| Sawtimber | (Million board feet) | |
| Volume | 9,395.2 | 2.11 |
| Growth | 447.3 | 3.74 |
| Removals | 172.3 | 17.80 |
| Commercial forest land | (Thousand acres) | |
| | 3,801.6 | 0.48 |

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for growing-stock volume in a particular county is higher than that for total growing-stock volume in the Survey Unit (table 74 shows the sampling errors for estimates smaller than Unit totals).

# SURVEY PROCEDURES

The major steps in the survey of the Eastern Upper Peninsula Unit were as follows:

1. A total of 21,176 1-acre points were systematically distributed across aerial photos of the entire Unit, except the Hiawatha National Forest. These points were classified into land classes as shown below to make a preliminary estimate of forest area. Next, 16,767 of these points were stereoclassified as to forest type, stand-size class, and density. Finally, 2,613 points were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken.

| | Photo points | | Ground plots |
|---|---|---|---|
| | Classified | Stereoclassified | visited |
| Forest land | 16,585 | 16,585 | 2,041 |
| Unproductive forest land | 112 | 112 | 14 |
| Nonforest land | | | |
| With trees | 144 | 18 | 18 |
| Without trees | 3,744 | 0 | 467 |
| Water | 539 | 0 | 66 |
| Questionable | 52 | 52 | 7 |
| Total | 21,176 | 16,767 | 2,613 |

At each of the forest ground check locations, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre. Tree measurements made at these locations and at 141 plots established in 1966 and remeasured in 1980 were the basis for estimates of timer volume, growth, mortality, number of trees, and other forest classifications on land other than National Forest land. The National Forest procedure is discussed in item 3.

2. Growth and mortality on all commercial forest land were estimated using the STEMS[3] after it was adjusted with factors derived from the 1979 remeasurement of permanent sample plots in the Upper Peninsula that were established in 1965. STEMS is an individual tree-growth projection system that uses the following stand and tree characteristics to "grow" trees by updating tree diameter and tree status (live, dead, or cut): species, tree diameter, crown ratio, site index, basal area, and average stand diameter. These characteristics were used to produce growth and mortality rates that were adjusted based on ground

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[3] *Stand and Tree Evaluation Modeling System. For more information on STEMS, see: Belcher, D. L., Holdaway, M. R.; Brand, G. J. STEMS: The stand and tree evaluation and modeling system. Gen. Tech. Rep. NC-79. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; (In prep.). p.*

conditions gained from remeasurement of plots and applied to trees on the tree list to yield an updated tree list. Local volume equations were applied to the original and updated tree lists to estimate volumes of growth and mortality.

3. The Hiawatha National Forest provided the Station with the area of commercial forest land by forest type, stand-size class and density for the Forest, and cubic foot removals by species since 1976. One hundred twenty-seven plots measured in 1976 were then updated with STEMS to provide estimates of current volume, growth, and mortality for the Forest. Area and volume tables for the National Forest were approved by the Hiawatha National Forest staff before publication.

4. Statistics on timber utilization during 1978 were obtained from mill surveys. The Michigan Department of Natural Resources canvassed resident sawmills, veneer mills, and other primary wood-using plants. The North Central Forest Experiment Station canvassed out-of-State sawmills, pulpmills, and veneer mills to determine their use of Michigan timber. Fuelwood and fencepost output were based on a sample of public and private landowners to determine their production of fuelwood and fenceposts and on a canvass of industrial and public timber owners. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Michigan primary wood-using plants. Timber cut for products by ownership class was determined by a canvass of public and industrial timber owners. The portion of timber cut unaccounted for by the latter owners was grouped under "farmer and other owners."

5. A total of 2,239 felled trees on 123 active logging operations were measured throughout the State during 1977 and 1978 to develop wood utilization factors for converting timber products output to timber removals for saw logs and pulpwood. Factors for all other products were obtained during the 1964 and 1965 Michigan utilization study.

6. Field data were compiled and analyzed.

## COMPARING MICHIGAN'S FOURTH INVENTORY WITH THE THIRD INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in timber volumes. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for each Forest Survey Unit in Michigan to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

In Michigan's Eastern Upper Peninsula Unit definitional or procedural changes between the 1966 and 1980 inventories included the procedures for determining the area of nonforest land by land class, the number of trees by 2-inch diameter class, and the volume equations.

In the 1966 forest inventory, the 1964 Census of Agriculture estimates of cropland and pasture and rangeland areas were used in the inventory report tables. For the 1980 inventory, we estimated cropland, pasture, and rangeland from aerial photos. The published 1966 estimates of cropland, pasture, and rangeland areas were adjusted to be compatible with 1980 estimates.

The procedures used to determine the number of growing-stock trees by species group and 2-inch diameter class have improved between the 1966 and 1980 forest inventories. The procedure used in 1966 over-estimated the number of growing-stock trees, especially in the lower diameter classes. We adjusted the 1966 estimates of number of trees so that differences between 1966 and 1980 represent actual changes in the resource, not changes in procedures.

The volume equations used in 1980 more accurately estimated tree volume than those used in 1966. Therefore, we adjusted the 1966 volumes by factors derived from the 1980 volume equations to make them comparable to 1980 volumes.

It should be noted that the 1980 inventory was 33 percent more intense thereby providing a more accurate information base than the 1966 inventory. Therefore, direct comparisons of the reports should be made with this in mind.

To ensure that it was possible to move from the adjusted 1966 volumes to the 1980 volumes, we then made a test by means of Timber Resource Analysis System (TRAS), a Forest Service computer program for updating, backdating, and projecting timber volume, growth, mortality, and removals. Using the 1966 numbers of softwood and hardwood trees by 2-inch diameter class and applying 1980 cubic feet per tree and board foot-cubic foot ratios yields estimates of 1966 softwood and hardwood volumes that are comparable with 1980 volumes. Then, using growth rates, mortality rates, and removals rates for the period between the two surveys, TRAS moves the inventories through the period. The program prints out volumes by diameter class and softwoods and hardwoods for each year in the period. Thus, inconsistencies in volume, growth, mortality, and removals can be identified and resolved.

TRAS generates an estimate of what total removals had to be for the inventory to have changed as it did between surveys given the volume, growth and mortality inputs. Estimates for removals for products and for logging residues (two of the three components of total timber removals) are available from an independent utilization study. An estimate of "other" removals (see Definition of Terms in Appendix), the third component of total removals, is made by subtracting the first two removals components from the TRAS-generated total removals estimate. This estimate of "other" removals is compared with findings from remeasurement plots and new plots (stump counts and land use change) to check its validity. Total removals are "trend level removals" because the estimate of "other" removals is based on a removals trend line from 1966 to 1980.

In 1966 State Forest was a separate owner class and included only land on State Forests. Other forested State-owned land was included under the Other Public owner class. In 1980 the State owner class included all State land. However, State-owned land not within State Forest areas is small in the eastern Upper Peninsula and general comparisons may be made with the 1966 and 1980 State figures.

Some mining companies were called diversified forest industry in 1966 and classed under Forest Industry owner class. In 1980 these companies were included in the Miscellaneous Private Corporation owner class. Therefore, it is possible to compare statistics for Forest Industry owner between 1966 and 1980 by combining the Industry and Miscellaneous Private Corporation categories from the 1980 report.

## LOG GRADE

In Michigan's Eastern Upper Peninsula the butt log of every sawtimber tree on every full permanent sample plot (2,973 trees) was graded for quality. Additionally, all of the logs in a smaller sample of trees throughout the State (2,239 trees) were graded. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire Unit.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber"[4]. The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

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[4] *Vaughn, C. L.; Wollin, A. C.; McDonald, K. A.; Bulgrin, E. H. Hardwood log grades for standard lumber. Res. Pap. FPL 63. Madison, WI: Department of Agriculture, Forest Service, Forest Products Laboratory; 1966. 52 p.*

# Forest Service standard grades for hardwood factory saw logs

| Grading factors | | Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Log grade 1 | | | Log grade 2 | | | | Log grade 3 |
| Position in tree | | Butts only | Butts and uppers | | Butts and uppers | | | | Butts and uppers |
| Scaling diameter, inches | | [1]13-15 | 16-19 | 20+ | [2]11+ | 12+ | | | 8+ |
| Length without trim, feet | | 10+ | | | 10+ | 8-9 | 10-11 | 12+ | 8+ |
| Required clear cuttings[3] of each of three best faces[4] | Min. length, feet | 7 | 5 | 3 | 3 | 3 | 3 | 3 | 2 |
| | Max. number | 2 | 2 | 2 | 2 | 2 | 2 | 3 | No Limit |
| | Min. proportion of log length required in clear cutting | ⅚ | ⅚ | ⅚ | ⅔ | ¾ | ⅔ | ⅔ | ½ |
| Maximum sweep and crook allowance | For logs with less than one-fourth of end in sound defects | 15 percent | | | 30 percent | | | | 50 percent |
| | For logs with more than one-fourth of end in sound defects | 10 percent | | | 20 percent | | | | 35 percent |
| Maximum scaling deduction | | 40 percent[5] | | | 50 percent[6] | | | | 50 percent |

[1] Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.
[2] Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.
[3] A clear cutting is a portion of a face, extending the width of the face, that is free of defects.
[4] A face is one-fourth of the surface of the log as divided lengthwise.
[5] Otherwise #1 logs with 41-60 percent deductions can be #2.
[6] Otherwise #2 logs with 51-60 percent deductions can be #3.

# Forest Service standard specifications for hardwood construction logs (tie and timber logs)[1]

| | | |
|---|---|---|
| Position in tree | | Butt and upper |
| Min. Diameter, Small end | | 8 inches + |
| Min. length, without trim | | 8 feet |
| Clear cuttings | | No requirements. |
| Sweep allowance, absolute | | One-fourth of the diameter at the small end for each 8 feet of length. |
| Sound surface defects | Single knots | Any number, if no one knot has an aver age diameter above the callus in excess of one-third of the log diameter at point of occurrence. |
| | Whorled knots | Any number if sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence. |
| | Holes | Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber.[2] |
| Unsound surface defects | | Same requirements as for sound defects if they extend into included timber.[2] No limit if they do not. |
| End defects | Sound | No requirements. |
| | Unsound | None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit a longitudinal split not extending more than 5 inches into the contained timber. |

[1] These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, then it may be necessary to subdivide the class into grades.

[2] Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications on the next page.

# Log Grades for Eastern White Pine

| Log grade | Minimum size Diameter | Length[1] | Sweep or crook allowance | Total cull allowance including sweep | Maximum weevil injury | Allowable knot size (inches)[2] on three best faces or minimum clearness on four faces |
|---|---|---|---|---|---|---|
| | (Inches) | (Feet) | (Percent) | | (Number) | (Inches) |
| 1 | 12 & 13 | 8-16 | 20 | 50 | 0 | Four faces clear full length |
| | 14 + | 10-16 | 20 | 50 | 0 | Two faces clear full length, or four faces clear 50 percent length (6 foot min. length)[3] |
| 2 | 6 + | 8-16 | 30 | 50 | 0 | Sound knots 1.e[4] D/6 and less than 3 inches.[5]<br>Unsound knots: 1.e. 1½ inches and for: butt, lots 1.e. D/12, upper logs 1.e. D/10, or four faces clear 50 percent of length |
| 3 | 6 + | 8-16 | 40 | 50 | 8-foot logs 1 weevil<br>10-foot logs: 2 weevils | Sound knots 1.e.D/3 and less than 5 inches<br>Unsound knots 1.e. D/6 and less than 2½ inches. |
| 4 | 6 + | 8-16 | 50 | 50 | No limit | No limit |

[1] Plus trim.
[2] Disregard all knots less than inch diameter in all grades.
[3] The sum of the diameter of sound knots plus twice the sum of the diameter of unsound knots (in inches) is less than or equal to of the diameter of the log (inches).
[4] 1.e. means less than or equal to.
[5] D means d.i.b. of log at location of knot.

## Log Grades for Jack Pine and Red Pine

*Grade 1:* logs with three or four clear faces.[5]

*Grade 2:* logs with one or two clear faces.

*Grade 3:* logs with no clear faces.

After the tentative log grade is established, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one third the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log grade if conk, massed hyphae, or other evidence of advance heart rot is found anywhere in it.

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[5] *A face is one fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than ½-inch in diameter, overgrown knots of any size, holes more than ¼-inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.*

## Log Grades for All Other Softwood Logs

**Grade 1**

1. Logs must be 16 inches in diameter or larger, 10 feet or longer, and with deduction for defect not more than 30 percent of gross scale.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not more than 2- inches in size.

**Grade 2**

1. Logs must be 12 inches in diameter or larger, 10 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.
2. Logs must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

**Grade 3**

1. Logs must be 6 inches in diameter or larger, 8 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.

Note: (A) Diameters are diameter inside bark (d.i.b.) at small end of log.
(B) Percent clear refers to percent clear in one continuous section.

# TREE SPECIES GROUPS IN MICHIGAN'S EASTERN UPPER PENINSULA UNIT[6]

| | |
|---|---|
| SOFTWOODS | |
| Eastern white pine | *Pinus strobus* |
| Red pine | *Pinus resinosa* |
| Jack pine | *Pinus banksiana* |
| White spruce | *Picea glauca* |
| Black spruce | *Picea mariana* |
| Balsam fir | *Abies balsamea* |
| Eastern hemlock | *Tsuga canadensis* |
| Tamarack | *Larix laricina* |
| Northern white-cedar | *Thuja occidentalis* |
| OTHER SOFTWOODS | |
| Eastern redcedar | *Juniperus virginiana* |
| Norway spruce | *Picea abies* |
| HARDWOODS | |
| White oaks | |
| Bur oak | *Quercus macrocarpa* |
| Select red oak | |
| Northern red oak | *Quercus rubra* |
| Yellow birch | *Betula alleghaniensis* |
| Hard maples | |
| Sugar maple | *Acer saccharum* |
| Black maple | *Acer nigrum* |
| Soft maples | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| American beech | *Fagus grandifolia* |
| Ashes | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Balsam poplar | *Populus balsamifera* |
| Eastern cottonwood | *Populus deltoides* |
| Aspens | |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| Basswood | *Tilia americana* |
| Black cherry | *Prunus serotina* |
| Elms | |
| American elm | *Ulmus americana* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomasii* |
| Paper birch | *Betula papyrifera* |
| OTHER HARDWOODS | |
| Boxelder | *Acer negundo* |
| River birch | *Betula nigra* |
| Black willow | *Salix nigra* |

# METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilogram.
1 ton = 0.907 metric ton.

# DEFINITION OF TERMS

**Acceptable trees.**—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

**Area-condition classes.**—Class 10.—Areas fully stocked with desirable trees but not overstocked.

*Class 20.*—Areas fully stocked with desirable trees but overstocked with all live trees.

*Class 30.*—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

*Class 40.*—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

*Class 50.*—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

*Class 60.*—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

*Class 70.*—Areas poorly stocked with desirable trees and poorly stocked with growing-stock trees.

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

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[6] *The common and scientific names are based on: Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handbk. 541. Washington, D.C.: U.S. Department of Agriculture, Forest Service, 1979. 375 p.*

**Biomass.**—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of 5 components:

*Growing-stock bole.*—Biomass of a growing-stock tree from a 1-foot stump to a variable 4-inch top.

*Growing-stock tops and limbs.*—Biomass of a growing-stock tree from a 1-foot stump minus the growing-stock bole.

*Cull bole.*—Biomass of a cull tree from a 1-foot stump to a variable 4-inch top.

*Cull tops and limbs.*—Biomass of a cull tree from a 1-inch stump minus the cull bole.

*1- to 5-inch trees.*—Biomass of all live trees 1- to 5-inches in diameter at breast height.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

**County and municipal land.**—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

**Cull.**—Portions of a tree that are unusable for industrial wood products, because of rot, form, or other defect.

**Desirable trees.**—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

**Diameter classes.**—A classification of trees based on diameter outside bark, measured at breast height (4- feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Survey, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h. inclusive).

**Farm.**—Either a place operated as a unit of 10 or more acres from which the sale of agricultural products totals $50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least $250. Places having less than the $50 or $250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce goods in sufficient quantity to meet the requirements of the definition.

**Farmer-owned land.**—Land owned by farm operators. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest trees.**—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

**Forest type.**—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Michigan are:

*Jack pine.*—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

*Red pine.*—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

*White pine.*—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

*Balsam fir.*—Forests in which balsam fir and white spruce comprise a plurality of stocking with balsam fir the most common. (Common associates include white spruce, aspen, maple, birch, northern white-cedar, and tamarack.)

*White spruce.*—Forests in which white spruce and balsam fir comprise a plurality of the stocking with white spruce the most common. (Common associates include balsam fir, aspen, maple, birch, northern white-cedar, and tamarack.)

*Black spruce.*—Forests in which swamp conifers comprise a plurality of the stocking with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

*Northern white-cedar.*—Forests in which swamp conifers comprise a plurality of the stocking with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

*Tamarack.*—Forests in which swamp conifers comprise a plurality of the stocking with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

*Oak-hickory.*—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, beech, yellow-poplar, elm, and maple.)

*Elm-ash-soft maple.*—Forests in which lowland elm, ash, cottonwood, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include birches, spruce, and balsam fir.)

*Maple-birch.*—Forests in which sugar maple, basswood, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, hemlock, and basswood.)

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

*Paper birch.*—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

*Exotic.*—Forests in which species not native to Michigan comprise a plurality of the stocking. (Mostly scotch pine plantations.)

**Gross area.**—The entire area of land and water as determined by the Bureau of the Census, 1970.

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by multiplying by 79 cubic feet per solid wood cord.

**Hardwoods.**—Dicotyledonous trees, usually broad-leaved and deciduous.

**Idle farmland.**—Includes former croplands, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

**Improved pasture.**—Land currently improved for grazing, by cultivation, seeding, irrigation, or clearing of trees or brush, and less than 16.7 percent stocked with live trees.

**Indian land.**—Tribal lands held in fee but administered by the Federal Government.

**Land area.**—A. *Bureau of the Census.* The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Survey.* The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Live trees.**—Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

**Log grades.**—A classification of logs based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

**Logging residues.**—The unused growing stock portions of trees cut or killed by logging.

**Maintained road.**—Any road, hard-topped or other surfaces, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

**Marsh.**—Nonforest land that characteristically supportslow, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

**Merchantable.**—Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

**Miscellaneous Federal land.**—Federal land other than National Forest, and land administered by the Bureau of Land Management.

**Miscellaneous private land.**—Privately owned land other than forest-industry and farmer-owned land.

**Mortality.**—The volume of sound wood in growing-stock and sawtimber trees that die annually.

**National Forest land.**—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

**Net annual growth of growing-stock.**— The annual change in volume of sound wood in live sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

**Net annual growth of sawtimber.**—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

**Net volume.**—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land.

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area, to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Other removals.**—Growing-stock trees removed but not utilized for products, or trees left standing but "removed" from the commercial forest land classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

**Ownership.**—Property owned by one owner, regardless of the number of parcels in a specified area.

**Ownership size class.**—The amount of commercial forest land owned by one owner, regardless of the number or parcels.

**Owner tenure.**—The length of time a property has been held by the owner.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Resources Evaluation inventories are:

*Xeric sites.*—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

**Plant byproducts.**—Plant residues used for products such as mulch, pulp chips, and fuelwood.

**Plant residues.**—Wood and bark materials generated at manufacturing plants during production of other products.

**Poletimber stands.**—(See stand-size class.)

**Poletimber trees.**—Growing-stock trees of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten trees.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough trees.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Roundwood products.**—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs; veneer logs and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

**Salvable dead trees.**—Standing or down dead trees that are considered merchantable by Regional standards.

**Saplings.**—Live trees 1.0 to 5.0 inches d.b.h.

**Sapling-seedling stands.**—(See stand-size class.)

**Saw log.**—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by Regional standards.

**Saw log portion.**—That part of the bole of sawtimber trees between the stump and the saw log top.

**Saw log top.**—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

**Sawtimber stands.**—(See stand-size class.)

**Sawtimber trees.**—Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting Regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

**Sawtimber volume.**—Net volume of the saw log portion of live sawtimber in board feet, International inch rule, from stump to a minimum 7 inches top diameter outside bark (d.o.b.) for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

**Seedlings.**—Live trees less than 1.0 inch d.b.h. that areexpected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Short-log (rough tree).**—Sawtimber-size trees of commercial species that contain at least one merchantable 8-to 11-foot saw log but not a 12-foot saw log.

**Shrub biomass.**—The total above-ground weight (including the bark) of selected shrubs and trees less than 1 inch d.b.h.

**Site class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-area class.**—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

**Stand-size class.**—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings.

a. *Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

b. *Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

c. *Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

d. *Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

**State land.**—Land owned by States, or land leased to these governmental units for 50 years or more.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Timber removals from growing stock.**—The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals.

**Timber removals from saw timber.**—The net board-foot volume of live sawtimbertrees removed for forest products annually (including roundwood products and logging residues) and for other removals.

**Timber products output.**—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

**Tree biomass.**—The total aboveground weight (including the bark) of all trees 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark) from a 1-foot stump for trees more than 5 inches in diameter.

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

**Upper stem portion.**—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

**Urban and other areas.**—Areas within the legal boundaries of cities andtowns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards, cemeteries, roads; railroads; airports; beaches; powerlines; and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

**Wooded strip.**—An acre or more of natural continuous forest land that would otherwise meet survey standards for commercial forest land except that it is less than 120 feet wide.

# TABLES

## AREA

Table 1.—Area of land by land class, 1966 and 1980

Table 2.—Area of land by land use class and county

Table 3.—Area of commercial forest land by ownership class and county

Table 4.—Area of commercial forest land by forest type, physiographic class, and ownership class

Table 5.—Area of commercial forest land by ownership class and site class

Table 6.—Area of commercial forest land by ownership class and stand-volume class

Table 7.—Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner

Table 8.—Area of commercial forest land by forest type, stand-size class, and ownership class

Table 9.—Area of commercial forest land by forest type and county

Table 10.—Area of commercial forest land by county and stand-size class

Table 11.—Area of commercial forest land by forest type, stand-size class, and site class

Table 12.—Area of commercial forest land by forest type and stand-age class

Table 13.—Area of commercial forest land by forest type and site-index class

Table 14.—Area of commercial forest land by forest type, stand-size class, and basal-area class

Table 15.—Area of commercial forest land by stocking class of growing-stock trees and stand-size class

Table 16.—Area of commercial forest land by stocking class based on selected stand components

Table 17.—Area of noncommercial forest land by ownership class

Table 18.—Area of noncommercial forest land by forest type

Table 19.—Area of nonforest land with trees by forest type and land use

## NUMBER OF TREES

Table 20.—Number of all live trees on commercial forest land by species group and diameter class

Table 21.—Number of growing-stock trees on commercial forest land by species group and diameter class

Table 22.—Number of short-log trees on commercial forest land by species group and diameter class

# VOLUME

Table 23.—Net volume of growing stock on commercial forest land by species, 1966 and 1980

Table 24.—Net volume of all live trees on commercial forest land by species group and diameter class

Table 25.—Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods

Table 26.—Net volume of growing-stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species

Table 27.—Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species

Table 28.—Net volume of growing stock on commercial forest land by county and species group

Table 29.—Net volume of sawtimber on commercial forest land by county and species group

Table 30.—Net volume of growing stock on commercial forest land by species group and diameter class

Table 31.—Net volume of sawtimber on commercial forest land by species group and diameter class

Table 32.—Net volume of growing stock on commercial forest land by species group and forest type

Table 33.—Net volume of sawtimber on commercial forest land by species group and forest type

Table 34.—Net volume of growing stock on commercial forest land by species group and ownership class

Table 35.—Net volume of sawtimber on commercial forest land by species group and ownership class

Table 36.—Net volume of growing stock on commercial forest land by forest type and stand-age class

Table 37.—Net volume of sawtimber on commercial forest land by forest type and stand-age class

Table 38.—Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 39.—Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 40.—Net volume of sawtimber on commercial forest land by species group and log-grade class

Table 41.—Net volume of short-log trees on commercial forest land by species group and diameter class

Table 42.—Net volume of short-log trees on commercial forest land by species group and diameter class

# GROWTH AND REMOVALS

Table 43.—Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, 1965-1979

Table 44.—Net annual growth of growing stock on commercial forest land by species group and county

Table 45.—Net annual growth of sawtimber on commercial forest land by species group and county

Table 46.—Net annual growth of growing stock on commercial forest land by species group and ownership class

Table 47.—Net annual growth of sawtimber on commercial forest land by species group and ownership class

Table 48.—Net annual growth of growing stock on commercial forest land by species group and forest type

Table 49.—Net annual growth of sawtimber on commercial forest land by species group and forest type

Table 50.—Net annual growth of growing stock on commercial forest land by forest type and stand-age class

Table 51.—Net annual growth of sawtimber on commercial forest land by forest type and stand-age class

Table 52.—Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 53.—Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 54.—Timber removals from growing-stock on commercial forest land by species group and county

Table 55.—Timber removals from sawtimber on commercial forest land by species group and county

Table 56.—Timber removals from growing stock and sawtimber on commercial forest land by species group, 1965 and 1979

Table 57.—Timber removals from growing stock and sawtimber on commercial forest land by item and species category

Table 58.—Net annual growth and removals of growing stock on commercial forest land by species group Table 59.—Net annual growth and removals of sawtimber on commercial forest land by species group

Table 60.—Net annual growth and removals of growing stock on commercial forest land by ownership class and softwoods and hardwoods

Table 61.—Net annual growth and removals of sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## MORTALITY

Table 62.—Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, 1965 and 1979

Table 63.—Annual mortality of growing stock on commercial forest land by species group and cause

Table 64.—Annual mortality of sawtimber on commercial forest land by species group and cause

Table 65.—Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## UTILIZATION

Table 66.—Output of timber products by source of material and softwoods and hardwoods

Table 67.—Output of roundwood products by source and softwoods and hardwoods

Table 68.—Timber products from roundwood by species group and product

Table 69.—Volume of primary plant residue by kind of material and type of use

## BIOMASS

Table 70.—All live shrub biomass yields on commercial forest land by shrub species group and forest type

Table 71.—All live tree biomass yields on commercial forest land by species group and forest type

Table 72.—All live tree biomass on commercial forest land by species group and forest type

Table 73.—All live biomass by species group and tree biomass component

## SAMPLING ERRORS

Table 74.—Sampling errors for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land

Table 1.--Area of land by land class, Eastern Upper Peninsula, Michigan, 1966[1] and 1980

(In thousand acres)

| Land class | 1966[1] | 1980 |
|---|---|---|
| FOREST LAND | | |
| Commercial forest | | |
| Jack pine | 276.2 | 229.1 |
| Red pine | 173.8 | 139.8 |
| White pine | 22.7 | 68.7 |
| Balsam fir-white spruce | 393.1 | 247.5 |
| Black spruce | 224.9 | 283.1 |
| Northern white-cedar | 566.8 | 594.9 |
| Tamarack | 70.4 | 43.8 |
| Oak-hickory | 19.8 | 19.3 |
| Elm-ash-soft maple | 327.7 | 191.8 |
| Maple-birch | 1,199.1 | 1,160.2 |
| Aspen | 758.9 | 671.4 |
| Paper birch | 97.8 | 110.5 |
| Exotic | -- | 1.2 |
| Nonstocked | 37.9 | 40.2 |
| Subtotal | 4,169.1 | 3,801.6 |
| Noncommercial forest land | | |
| Unproductive | 79.5 | 102.4 |
| Productive-reserved | 32.7 | 127.6 |
| Subtotal | 112.2 | 230.0 |
| Total | 4,281.3 | 4,031.6 |
| NONFOREST LAND | | |
| Cropland | 351.2 | 467.2 |
| Pasture and range | 3.6 | 4.3 |
| Other | 376.5 | 495.9 |
| Total | 731.3 | 967.4 |
| TOTAL LAND | [2]5,012.6 | [3]4,999.0 |
| WATER (BUREAU OF THE CENSUS) | [2]152.2 | [3]165.8 |
| TOTAL LAND AND WATER | [2]5,164.8 | [3]5,164.8 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

[2] U.S. Department of Commerce, Bureau of Census. 1950.

[3] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 2.--Area of land by land use class and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Land use class | All counties | County | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| FOREST LAND | | | | | | | | |
| Commercial forest | 3,801.6 | 491.9 | 705.9 | 574.5 | 468.4 | 524.3 | 493.4 | 543.2 |
| Unproductive forest | 102.4 | 5.0 | 23.8 | 21.9 | 17.0 | 19.7 | 1.9 | 13.1 |
| Productive reserved | 127.6 | 33.8 | 27.8 | 0.4 | 11.1 | 21.0 | 0.9 | 32.6 |
| Total | 4,031.6 | 530.7 | 757.5 | 596.8 | 496.5 | 565.0 | 496.2 | 588.9 |
| NONFOREST LAND | | | | | | | | |
| Nonforest with trees | | | | | | | | |
| Cropland with trees | 3.4 | -- | -- | -- | -- | 1.7 | 1.7 | -- |
| Improved pasture with trees | 2.5 | -- | -- | 2.5 | -- | -- | -- | -- |
| Wooded strips | 24.9 | 1.7 | 7.0 | 8.7 | -- | -- | 3.5 | 4.0 |
| Idle farmland with trees | 1.8 | -- | 1.8 | -- | -- | -- | -- | -- |
| Marsh with trees | 49.0 | -- | 5.5 | 1.7 | 11.7 | 8.6 | 6.3 | 15.2 |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | 1.7 | -- | -- | -- | -- | 1.7 | -- | -- |
| Wooded pasture | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 83.3 | 1.7 | 14.3 | 12.9 | 11.7 | 12.0 | 11.5 | 19.2 |
| Nonforest without trees | | | | | | | | |
| Cropland without trees | 446.4 | 18.4 | 160.5 | 96.2 | 5.3 | 27.2 | 119.9 | 18.9 |
| Improved pasture without trees | 1.8 | -- | -- | -- | 1.8 | -- | -- | -- |
| Idle farm without trees | 2.0 | 2.0 | -- | -- | -- | -- | -- | -- |
| Marsh without trees | 240.3 | 7.1 | 29.4 | 8.0 | 53.0 | 16.2 | 8.0 | 118.6 |
| Other farm-farmstead | 17.4 | 1.8 | 1.7 | 5.2 | 1.8 | -- | 6.9 | -- |
| Urban and other | 162.5 | 15.6 | 51.7 | 28.9 | 10.0 | 27.0 | 21.8 | 7.5 |
| Noncensus water | 13.7 | 1.6 | 2.5 | 5.0 | -- | 1.7 | -- | 2.9 |
| Subtotal | 884.1 | 46.5 | 245.8 | 143.3 | 71.9 | 72.1 | 156.6 | 147.9 |
| Total | 967.4 | 48.2 | 260.1 | 156.2 | 83.6 | 84.1 | 168.1 | 167.1 |
| TOTAL LAND | 4,999.0 | 578.9 | 1,017.6 | 753.0 | 580.1 | 649.1 | 664.3 | 756.0 |
| WATER (BUREAU OF THE CENSUS) | [1]165.8 | 18.9 | 39.0 | 16.3 | 14.5 | 42.7 | 3.9 | 30.5 |
| TOTAL LAND AND WATER | [1]5,164.8 | 597.8 | 1,056.6 | 769.3 | 594.6 | 691.8 | 668.2 | 786.5 |

[1] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 3.--Area of commercial forest land by ownership class and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All counties | County | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| National Forest | 741.4 | 106.1 | 197.5 | 210.5 | -- | 123.3 | -- | 104.0 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 20.6 | -- | 3.1 | -- | -- | -- | -- | 17.5 |
| Indian | 6.0 | -- | -- | -- | -- | -- | 6.0 | -- |
| State | 976.6 | 90.8 | 168.8 | 63.4 | 209.4 | 167.3 | 79.3 | 197.6 |
| County and municipal | 8.9 | 1.4 | -- | 1.5 | -- | -- | 1.4 | 4.6 |
| Forest industry | 635.5 | 172.6 | 69.6 | 80.9 | 123.1 | 29.8 | 74.4 | 85.1 |
| Farmer | 478.2 | 79.7 | 77.7 | 118.5 | 7.8 | 44.3 | 125.3 | 24.9 |
| Misc. private-corp. | 227.9 | 9.2 | 41.4 | 7.6 | 12.7 | 82.8 | 62.0 | 12.2 |
| Misc. private-indiv. | 706.5 | 32.1 | 147.8 | 92.1 | 115.4 | 76.8 | 145.0 | 97.3 |
| All owners | 3,801.6 | 491.9 | 705.9 | 574.5 | 468.4 | 524.3 | 493.4 | 543.2 |

Table 4.--Area of commercial forest land by forest type, physiographic class, and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and physiographic class | All owners | Ownership class: National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | | | | | | | | | | | |
| Hydric | 0.7 | 0.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 47.9 | 24.4 | -- | 4.2 | -- | 17.7 | -- | -- | -- | -- | 1.6 |
| Mesic | 16.1 | -- | -- | -- | -- | 14.6 | -- | -- | -- | -- | 1.5 |
| Xeromesic | 144.8 | 58.2 | -- | 2.9 | -- | 66.2 | -- | 4.3 | 2.9 | 2.9 | 7.4 |
| Xeric | 19.6 | 11.8 | -- | -- | -- | 7.8 | -- | -- | -- | -- | -- |
| All classes | 229.1 | 95.1 | -- | 7.1 | -- | 106.3 | -- | 4.3 | 2.9 | 2.9 | 10.5 |
| Red pine | | | | | | | | | | | |
| Hydric | 1.7 | -- | -- | -- | -- | 1.7 | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 37.0 | 10.5 | -- | 1.9 | -- | 16.3 | -- | -- | 3.7 | 1.5 | 3.1 |
| Xeromesic | 101.1 | 80.3 | -- | -- | -- | 16.2 | 1.4 | 1.4 | -- | -- | 1.8 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 139.8 | 90.8 | -- | 1.9 | -- | 34.2 | 1.4 | 1.4 | 3.7 | 1.5 | 4.9 |
| White pine | | | | | | | | | | | |
| Hydric | 1.5 | -- | -- | -- | -- | 1.5 | -- | -- | -- | -- | -- |
| Hydromesic | 18.1 | 4.1 | -- | -- | -- | 4.5 | -- | 4.7 | 3.3 | -- | 1.5 |
| Mesic | 39.8 | 7.4 | -- | -- | -- | 19.5 | -- | 3.2 | 3.0 | 3.7 | 3.0 |
| Xeromesic | 9.3 | -- | -- | -- | -- | 4.6 | -- | -- | -- | 1.7 | 3.0 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 68.7 | 11.5 | -- | -- | -- | 30.1 | -- | 7.9 | 6.3 | 5.4 | 7.5 |
| Balsam fir | | | | | | | | | | | |
| Hydric | 7.9 | -- | -- | -- | -- | 1.5 | -- | -- | 2.9 | -- | 3.5 |
| Hydromesic | 138.7 | 27.1 | -- | -- | -- | 28.7 | -- | 24.7 | 15.2 | 6.6 | 36.4 |
| Mesic | 57.4 | -- | -- | 1.5 | -- | 18.2 | -- | 7.5 | 10.8 | 8.2 | 11.2 |
| Xeromesic | 13.4 | 13.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 217.4 | 40.5 | -- | 1.5 | -- | 48.4 | -- | 32.2 | 28.9 | 14.8 | 51.1 |
| White spruce | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 11.9 | -- | -- | -- | -- | 3.1 | -- | -- | 1.4 | 4.5 | 2.9 |
| Mesic | 18.2 | -- | -- | -- | -- | 7.8 | -- | 2.8 | -- | 3.0 | 4.6 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 30.1 | -- | -- | -- | -- | 10.9 | -- | 2.8 | 1.4 | 7.5 | 7.5 |

(Table 4 continued on next page)

(Table 4 continued)

| Forest type and physiographic class | All owners | Ownership class: National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Black spruce | | | | | | | | | | | |
| Hydric | 62.3 | 23.4 | -- | -- | -- | 20.3 | -- | 4.6 | 2.7 | 6.5 | 4.8 |
| Hydromesic | 160.1 | 41.6 | -- | -- | -- | 58.5 | -- | 22.9 | 7.6 | 8.2 | 21.3 |
| Mesic | 16.2 | -- | -- | -- | -- | 7.6 | -- | -- | 1.5 | -- | 7.1 |
| Xeromesic | 44.5 | 44.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 283.1 | 109.5 | -- | -- | -- | 86.4 | -- | 27.5 | 11.8 | 14.7 | 33.2 |
| Northern white-cedar | | | | | | | | | | | |
| Hydric | 80.6 | 9.7 | -- | -- | -- | 29.6 | -- | 16.1 | 9.4 | 4.6 | 11.2 |
| Hydromesic | 477.7 | 37.4 | -- | -- | 1.6 | 133.1 | 3.1 | 101.2 | 70.5 | 37.0 | 93.8 |
| Mesic | 36.6 | -- | -- | -- | -- | 9.3 | -- | 6.2 | 8.8 | 3.1 | 9.2 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 594.9 | 47.1 | -- | -- | 1.6 | 172.0 | 3.1 | 123.4 | 88.8 | 44.7 | 114.2 |
| Tamarack | | | | | | | | | | | |
| Hydric | 11.2 | -- | -- | -- | -- | 4.6 | -- | 5.0 | -- | -- | 1.6 |
| Hydromesic | 32.6 | -- | -- | -- | -- | 17.1 | -- | 4.9 | 5.8 | -- | 4.8 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 43.8 | -- | -- | -- | -- | 21.7 | -- | 9.9 | 5.8 | -- | 6.4 |
| Oak-hickory | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 17.4 | 0.4 | -- | -- | -- | 6.3 | -- | -- | -- | 3.1 | 7.6 |
| Xeromesic | 1.9 | 0.4 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 19.3 | 0.8 | -- | -- | -- | 6.3 | -- | -- | -- | 3.1 | 9.1 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Hydric | 8.9 | -- | -- | -- | -- | 3.3 | -- | 1.6 | 1.0 | -- | 3.0 |
| Hydromesic | 182.9 | 6.3 | -- | -- | 1.5 | 43.3 | 1.5 | 36.1 | 40.5 | 9.3 | 44.4 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 191.8 | 6.3 | -- | -- | 1.5 | 46.6 | 1.5 | 37.7 | 41.5 | 9.3 | 47.4 |

(Table 4 continued on next page)

(Table 4 continued)

| Forest type and physiographic class | All owners | Ownership class |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Maple-birch |  |  |  |  |  |  |  |  |  |  |  |
| Hydric | 1.4 | -- | -- | -- | -- | -- | -- | 1.4 | -- | -- | -- |
| Hydromesic | 87.2 | 15.0 | -- | -- | -- | 11.1 | -- | 31.5 | 12.0 | 1.5 | 16.1 |
| Mesic | 1,046.7 | 158.9 | -- | 1.6 | 2.9 | 192.1 | 2.9 | 273.6 | 130.2 | 63.1 | 221.4 |
| Xeromesic | 25.0 | 15.7 | -- | -- | -- | 7.8 | -- | -- | 1.5 | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 1,160.3 | 189.6 | -- | 1.6 | 2.9 | 211.0 | 2.9 | 306.5 | 143.7 | 64.6 | 237.5 |
| Aspen |  |  |  |  |  |  |  |  |  |  |  |
| Hydric | 27.7 | 26.2 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5 |
| Hydromesic | 302.4 | 61.2 | -- | 1.5 | -- | 42.0 | -- | 41.1 | 66.5 | 15.7 | 74.4 |
| Mesic | 278.9 | 2.6 | -- | 3.9 | -- | 87.0 | -- | 29.6 | 58.6 | 18.9 | 78.3 |
| Xeromesic | 62.4 | 31.9 | -- | -- | -- | 21.1 | -- | -- | -- | 6.3 | 3.1 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 671.4 | 121.9 | -- | 5.4 | -- | 150.1 | -- | 70.7 | 125.1 | 40.9 | 157.3 |
| Paper birch |  |  |  |  |  |  |  |  |  |  |  |
| Hydric | 4.5 | -- | -- | -- | -- | -- | -- | 1.5 | 3.0 | -- | -- |
| Hydromesic | 51.2 | 16.9 | -- | -- | -- | 12.1 | -- | 6.5 | 4.6 | 3.1 | 8.0 |
| Mesic | 48.2 | -- | -- | 1.5 | -- | 21.8 | -- | 3.1 | 7.8 | 9.4 | 4.6 |
| Xeromesic | 6.6 | 6.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 110.5 | 23.5 | -- | 1.5 | -- | 33.9 | -- | 11.1 | 15.4 | 12.5 | 12.6 |
| Exotic |  |  |  |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 1.2 | -- | -- | -- | -- | -- | -- | -- | 1.2 | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 1.2 | -- | -- | -- | -- | -- | -- | -- | 1.2 | -- | -- |
| Nonstocked |  |  |  |  |  |  |  |  |  |  |  |
| Hydric | 8.0 | 1.7 | -- | -- | -- | 4.8 | -- | -- | -- | -- | 1.5 |
| Hydromesic | 7.1 | 1.2 | -- | -- | -- | 1.6 | -- | -- | 1.8 | -- | 2.5 |
| Mesic | 14.5 | 1.7 | -- | 1.6 | -- | 6.3 | -- | -- | -- | 1.6 | 3.3 |
| Xeromesic | 9.1 | 0.2 | -- | -- | -- | 4.5 | -- | -- | -- | 4.4 | -- |
| Xeric | 1.5 | -- | -- | -- | -- | 1.5 | -- | -- | -- | -- | -- |
| All classes | 40.2 | 4.8 | -- | 1.6 | -- | 18.7 | -- | -- | 1.8 | 6.0 | 7.3 |
| All types |  |  |  |  |  |  |  |  |  |  |  |
| Hydric | 216.4 | 61.7 | -- | -- | -- | 67.3 | -- | 30.2 | 19.0 | 11.1 | 27.1 |
| Hydromesic | 1,517.8 | 235.2 | -- | 5.7 | 3.1 | 372.8 | 4.6 | 273.6 | 229.2 | 85.9 | 307.7 |
| Mesic | 1,628.2 | 181.5 | -- | 12.0 | 2.9 | 406.8 | 2.9 | 326.0 | 225.6 | 115.6 | 354.9 |
| Xeromesic | 418.1 | 251.2 | -- | 2.9 | -- | 120.4 | 1.4 | 5.7 | 4.4 | 15.3 | 16.8 |
| Xeric | 21.1 | 11.8 | -- | -- | -- | 9.3 | -- | -- | -- | -- | -- |
| All classes | 3,801.6 | 741.4 | -- | 20.6 | 6.0 | 976.6 | 8.9 | 635.5 | 478.2 | 227.9 | 706.5 |

Table 5.--Area of commercial forest land by ownership class and site class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| National Forest | 741.4 | -- | -- | 23.5 | 85.4 | 241.3 | 391.2 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 20.6 | -- | -- | 1.5 | -- | 9.2 | 9.9 |
| Indian | 6.0 | -- | -- | -- | -- | 1.4 | 4.6 |
| State | 976.6 | -- | -- | 10.6 | 75.8 | 311.0 | 579.2 |
| County and municipal | 8.9 | -- | -- | -- | 2.8 | 1.5 | 4.6 |
| Forest industry | 635.5 | -- | -- | 4.8 | 60.0 | 212.8 | 357.9 |
| Farmer | 478.2 | -- | -- | 7.8 | 80.9 | 163.3 | 226.2 |
| Misc. private-corp. | 227.9 | -- | -- | 6.0 | 19.5 | 75.0 | 127.4 |
| Misc. private-indiv. | 706.5 | -- | -- | 15.7 | 94.8 | 273.9 | 322.1 |
| All owners | 3,801.6 | -- | -- | 69.9 | 419.2 | 1,289.4 | 2,023.1 |

Table 6.--Area of commercial forest land by ownership class and stand-volume class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Stand-volume class (board feet[1]) | | |
|---|---|---|---|---|
| | | Less than 1,500 | 1,500 to 5,000 | 5,000+ |
| National Forest | 741.4 | 378.7 | 219.2 | 143.5 |
| Bureau of Land Mgmt. | -- | -- | -- | -- |
| Miscellaneous federal | 20.6 | 11.2 | 9.4 | -- |
| Indian | 6.0 | 1.6 | 4.4 | -- |
| State | 976.6 | 493.1 | 373.3 | 110.2 |
| County and municipal | 8.9 | 6.0 | 2.9 | -- |
| Forest industry | 635.5 | 222.3 | 256.3 | 156.9 |
| Farmer | 478.2 | 246.8 | 182.5 | 48.9 |
| Misc. private-corp. | 227.9 | 103.8 | 89.9 | 34.2 |
| Misc. private-indiv. | 706.5 | 318.6 | 296.9 | 91.0 |
| All owners | 3,801.6 | 1,782.1 | 1,434.8 | 584.7 |

[1] International 1/4-inch rule.

Table 7.--Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| | | Size of owner (acres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ownership class and owner tenure class | Total | 1-4 | 5-10 | 11-20 | 21-50 | 51-100 | 101-500 | 501-2,500 | 2,501-5,000 | 5001+ |
| Forest Industry | | | | | | | | | | |
| 1-4 years | 136.7 | -- | -- | -- | -- | -- | -- | -- | -- | 136.7 |
| 5-9 years | 41.7 | -- | -- | -- | -- | -- | -- | -- | -- | 41.7 |
| 10-19 years | 48.6 | -- | -- | -- | -- | -- | -- | 1.5 | -- | 47.1 |
| 20+ years | 408.5 | -- | -- | -- | -- | -- | -- | 1.6 | -- | 406.9 |
| All classes | 635.5 | -- | -- | -- | -- | -- | -- | 3.1 | -- | 632.4 |
| Farmer | | | | | | | | | | |
| 1-4 years | 67.2 | -- | 1.5 | 2.8 | 10.5 | 15.3 | 33.0 | 1.5 | 1.0 | 1.6 |
| 5-9 years | 82.4 | -- | -- | -- | 13.1 | 31.5 | 28.4 | 8.0 | -- | 1.4 |
| 10-19 years | 121.5 | 1.5 | -- | 1.5 | 17.7 | 27.7 | 64.3 | 7.3 | 1.5 | -- |
| 20+ years | 207.1 | -- | 1.5 | 1.0 | 21.1 | 42.7 | 109.6 | 22.8 | -- | 8.4 |
| All classes | 478.2 | 1.5 | 3.0 | 5.3 | 62.4 | 117.2 | 235.3 | 39.6 | 2.5 | 11.4 |
| Misc. priv.-corporation | | | | | | | | | | |
| 1-4 years | 37.3 | -- | -- | -- | 1.5 | 3.2 | 6.6 | 10.5 | 1.5 | 14.0 |
| 5-9 years | 39.7 | -- | -- | -- | -- | 1.4 | 7.6 | 19.5 | 6.3 | 4.9 |
| 10-19 years | 21.5 | -- | -- | -- | -- | -- | 7.8 | 4.5 | 1.6 | 7.6 |
| 20+ years | 129.4 | -- | -- | -- | 1.5 | 3.1 | 7.9 | 21.2 | 1.5 | 94.2 |
| All classes | 227.9 | -- | -- | -- | 3.0 | 7.7 | 29.9 | 55.7 | 10.9 | 120.7 |
| Misc. priv.-individual | | | | | | | | | | |
| 1-4 years | 188.6 | 3.9 | 4.5 | 15.9 | 52.8 | 28.7 | 52.5 | 21.0 | 1.4 | 7.9 |
| 5-9 years | 185.0 | -- | 3.2 | 4.7 | 63.0 | 27.0 | 67.9 | 16.0 | -- | 3.2 |
| 10-19 years | 159.5 | -- | 1.4 | -- | 36.6 | 31.2 | 66.7 | 19.1 | 4.5 | -- |
| 20+ years | 173.4 | 1.5 | -- | 2.9 | 57.7 | 34.6 | 53.2 | 22.0 | -- | 1.5 |
| All classes | 706.5 | 5.4 | 9.1 | 23.5 | 210.1 | 121.5 | 240.3 | 78.1 | 5.9 | 12.6 |
| All private owners | | | | | | | | | | |
| 1-4 years | 429.8 | 3.9 | 6.0 | 18.7 | 64.8 | 47.2 | 92.1 | 33.0 | 3.9 | 160.2 |
| 5-9 years | 348.8 | -- | 3.2 | 4.7 | 76.1 | 59.9 | 103.9 | 43.5 | 6.3 | 51.2 |
| 10-19 years | 351.1 | 1.5 | 1.4 | 1.5 | 54.3 | 58.9 | 138.8 | 32.4 | 7.6 | 54.7 |
| 20+ years | 918.4 | 1.5 | 1.5 | 3.9 | 80.3 | 80.4 | 170.7 | 67.6 | 1.5 | 511.0 |
| All classes | 2,048.1 | 6.9 | 12.1 | 28.8 | 275.5 | 246.4 | 505.5 | 176.5 | 19.3 | 777.1 |

Table 8.--Area of commercial forest land by forest type, stand-size class, and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Jack pine | | | | | | | | | | | |
| Sawtimber | 38.1 | 1.7 | -- | 2.9 | -- | 24.8 | -- | 1.5 | 2.9 | 1.4 | 2.9 |
| Poletimber | 162.1 | 93.4 | -- | 4.2 | -- | 55.7 | -- | 2.8 | -- | 1.5 | 4.5 |
| Sapling & seedling | 28.9 | -- | -- | -- | -- | 25.8 | -- | -- | -- | -- | 3.1 |
| All stands | 229.1 | 95.1 | -- | 7.1 | -- | 106.3 | -- | 4.3 | 2.9 | 2.9 | 10.5 |
| Red pine | | | | | | | | | | | |
| Sawtimber | 38.4 | 14.8 | -- | 1.9 | -- | 20.0 | -- | -- | -- | -- | 1.7 |
| Poletimber | 59.8 | 46.2 | -- | -- | -- | 5.2 | 1.4 | 1.4 | 3.8 | -- | 1.8 |
| Sapling & seedling | 41.6 | 29.8 | -- | -- | -- | 8.9 | -- | -- | -- | 1.5 | 1.4 |
| All stands | 139.8 | 90.8 | -- | 1.9 | -- | 34.1 | 1.4 | 1.4 | 3.8 | 1.5 | 4.9 |
| White pine | | | | | | | | | | | |
| Sawtimber | 43.3 | 8.1 | -- | -- | -- | 14.3 | -- | 7.8 | 4.7 | 5.4 | 3.0 |
| Poletimber | 15.3 | 3.3 | -- | -- | -- | 7.5 | -- | -- | -- | -- | 4.5 |
| Sapling & seedling | 10.1 | -- | -- | -- | -- | 8.4 | -- | -- | 1.7 | -- | -- |
| All stands | 68.7 | 11.4 | -- | -- | -- | 30.2 | -- | 7.8 | 6.4 | 5.4 | 7.5 |
| Balsam fir | | | | | | | | | | | |
| Sawtimber | 48.7 | 27.1 | -- | 1.5 | -- | 4.8 | -- | 4.5 | 3.1 | -- | 7.7 |
| Poletimber | 102.6 | 13.4 | -- | -- | -- | 23.1 | -- | 14.5 | 18.1 | 9.3 | 24.2 |
| Sapling & seedling | 66.1 | -- | -- | -- | -- | 20.6 | -- | 13.2 | 7.7 | 5.4 | 19.2 |
| All stands | 217.4 | 40.5 | -- | 1.5 | -- | 48.5 | -- | 32.2 | 28.9 | 14.7 | 51.1 |
| White spruce | | | | | | | | | | | |
| Sawtimber | 10.4 | -- | -- | -- | -- | 3.1 | -- | -- | 1.4 | 3.0 | 2.9 |
| Poletimber | 10.5 | -- | -- | -- | -- | 3.0 | -- | -- | -- | 3.0 | 4.5 |
| Sapling & seedling | 9.2 | -- | -- | -- | -- | 4.9 | -- | 2.8 | -- | 1.5 | -- |
| All stands | 30.1 | -- | -- | -- | -- | 11.0 | -- | 2.8 | 1.4 | 7.5 | 7.4 |
| Black spruce | | | | | | | | | | | |
| Sawtimber | 6.5 | -- | -- | -- | -- | 3.4 | -- | 1.5 | -- | -- | 1.6 |
| Poletimber | 149.7 | 84.5 | -- | -- | -- | 31.2 | -- | 11.0 | 4.5 | 5.0 | 13.5 |
| Sapling & seedling | 126.9 | 25.1 | -- | -- | -- | 52.0 | -- | 14.8 | 7.3 | 9.7 | 18.0 |
| All stands | 283.1 | 109.6 | -- | -- | -- | 86.6 | -- | 27.3 | 11.8 | 14.7 | 33.1 |
| Northern white-cedar | | | | | | | | | | | |
| Sawtimber | 131.9 | 5.2 | -- | -- | -- | 48.9 | -- | 35.0 | 7.5 | 12.6 | 22.7 |
| Poletimber | 305.9 | 36.7 | -- | -- | -- | 85.6 | 1.6 | 63.2 | 46.4 | 20.1 | 52.3 |
| Sapling & seedling | 157.1 | 5.3 | -- | -- | 1.6 | 37.5 | 1.5 | 25.2 | 34.7 | 12.1 | 39.2 |
| All stands | 594.9 | 47.2 | -- | -- | 1.6 | 172.0 | 3.1 | 123.4 | 88.6 | 44.8 | 114.2 |

(Table 8 continued on next page)

(Table 8 continued)

| Forest type and stand-size class | All owners | Ownership class: National Forest | Bureau of Land Mgmt. | Misc. Federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | | | | | |
| Sawtimber | 1.4 | -- | -- | -- | -- | 1.4 | -- | -- | -- | -- | -- |
| Poletimber | 19.6 | -- | -- | -- | -- | 11.3 | -- | 3.6 | 1.5 | -- | 3.2 |
| Sapling & seedling | 22.8 | -- | -- | -- | -- | 9.0 | -- | 6.4 | 4.3 | -- | 3.1 |
| All stands | 43.8 | -- | -- | -- | -- | 21.7 | -- | 10.0 | 5.8 | -- | 6.3 |
| Oak-hickory | | | | | | | | | | | |
| Sawtimber | 6.3 | -- | -- | -- | -- | 1.6 | -- | -- | -- | 1.5 | 3.2 |
| Poletimber | 11.4 | 0.8 | -- | -- | -- | 3.1 | -- | -- | -- | 1.5 | 6.0 |
| Sapling & seedling | 1.6 | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- | -- |
| All stands | 19.3 | 0.8 | -- | -- | -- | 6.3 | -- | -- | -- | 3.0 | 9.2 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Sawtimber | 58.8 | 2.7 | -- | -- | 1.5 | 16.7 | -- | 7.8 | 6.2 | 3.2 | 20.7 |
| Poletimber | 70.7 | 3.6 | -- | -- | -- | 17.9 | -- | 12.3 | 22.0 | 3.0 | 11.9 |
| Sapling & seedling | 62.3 | -- | -- | -- | -- | 12.0 | 1.5 | 17.7 | 13.3 | 3.1 | 14.7 |
| All stands | 191.8 | 6.3 | -- | -- | 1.5 | 46.6 | 1.5 | 37.8 | 41.5 | 9.3 | 47.3 |
| Maple-birch | | | | | | | | | | | |
| Sawtimber | 519.0 | 63.0 | -- | -- | -- | 89.4 | -- | 198.8 | 47.6 | 23.4 | 96.9 |
| Poletimber | 483.7 | 126.5 | -- | 1.6 | 2.9 | 78.9 | 1.4 | 68.0 | 71.9 | 24.2 | 108.3 |
| Sapling & seedling | 157.6 | -- | -- | -- | -- | 42.5 | 1.5 | 39.9 | 24.0 | 17.0 | 32.7 |
| All stands | 1,160.3 | 189.5 | -- | 1.6 | 2.9 | 210.8 | 2.9 | 306.7 | 143.5 | 64.6 | 237.8 |
| Aspen | | | | | | | | | | | |
| Sawtimber | 93.6 | 16.0 | -- | -- | -- | 14.0 | -- | 1.5 | 30.3 | 10.7 | 21.1 |
| Poletimber | 353.6 | 80.6 | -- | 3.9 | -- | 72.9 | -- | 29.0 | 56.9 | 17.5 | 92.8 |
| Sapling & seedling | 224.2 | 25.4 | -- | 1.5 | -- | 63.1 | -- | 40.2 | 38.0 | 12.7 | 43.3 |
| All stands | 671.4 | 122.0 | -- | 5.4 | -- | 150.0 | -- | 70.7 | 125.2 | 40.9 | 157.2 |
| Paper birch | | | | | | | | | | | |
| Sawtimber | 9.6 | 1.9 | -- | -- | -- | 3.1 | -- | -- | -- | -- | 4.6 |
| Poletimber | 79.0 | 21.5 | -- | 1.5 | -- | 26.5 | -- | 6.1 | 9.3 | 11.0 | 3.1 |
| Sapling & seedling | 21.9 | -- | -- | -- | -- | 4.3 | -- | 5.0 | 6.1 | 1.5 | 5.0 |
| All stands | 110.5 | 23.4 | -- | 1.5 | -- | 33.9 | -- | 11.1 | 15.4 | 12.5 | 12.7 |
| Exotic | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1.2 | -- | -- | -- | -- | -- | -- | -- | 1.2 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1.2 | -- | -- | -- | -- | -- | -- | -- | 1.2 | -- | -- |
| Nonstocked | 40.2 | 4.8 | -- | 1.6 | -- | 18.6 | -- | -- | 1.8 | 6.1 | 7.3 |
| All types | | | | | | | | | | | |
| Sawtimber | 1,006.0 | 140.5 | -- | 6.3 | 1.5 | 245.5 | -- | 258.4 | 103.7 | 61.2 | 188.9 |
| Poletimber | 1,825.1 | 510.5 | -- | 11.2 | 2.9 | 421.9 | 4.4 | 211.9 | 235.6 | 96.1 | 330.6 |
| Sapling & seedling | 930.3 | 85.6 | -- | 1.5 | 1.6 | 290.6 | 4.5 | 165.2 | 137.1 | 64.5 | 179.7 |
| Nonstocked | 40.2 | 4.8 | -- | 1.6 | -- | 18.6 | -- | -- | 1.8 | 6.1 | 7.3 |
| All stands | 3,801.6 | 741.4 | -- | 20.6 | 6.0 | 976.6 | 8.9 | 635.5 | 478.2 | 227.9 | 706.5 |

## Table 9.--Area of commercial forest land by forest type and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All counties | County |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| Jack pine | 229.1 | 10.4 | 87.9 | 24.8 | 44.1 | 9.5 | 3.2 | 49.2 |
| Red pine | 139.8 | 21.9 | 32.4 | 26.2 | 14.9 | 15.7 | 1.4 | 27.3 |
| White pine | 68.7 | 11.0 | 7.2 | 2.6 | 15.1 | 4.6 | 10.0 | 18.2 |
| Balsam fir | 217.4 | 14.4 | 40.8 | 55.6 | 15.5 | 43.2 | 17.5 | 30.4 |
| White spruce | 30.1 | 3.0 | 5.8 | 1.6 | 5.8 | 9.2 | 1.5 | 3.2 |
| Black spruce | 283.1 | 16.6 | 69.9 | 46.1 | 29.4 | 48.8 | 21.9 | 50.4 |
| Northern white-cedar | 594.9 | 43.4 | 76.7 | 117.1 | 69.6 | 82.4 | 128.0 | 77.7 |
| Tamarack | 43.8 | -- | 3.1 | 4.3 | 9.7 | 4.7 | 15.8 | 6.2 |
| Oak-hickory | 19.3 | 0.1 | 5.1 | 1.9 | 1.5 | 0.1 | 10.6 | -- |
| Elm-ash-soft maple | 191.8 | 25.8 | 35.4 | 32.3 | 21.3 | 5.1 | 53.2 | 18.7 |
| Maple-birch | 1,160.3 | 313.0 | 163.5 | 104.4 | 191.0 | 135.4 | 112.1 | 140.9 |
| Aspen | 671.4 | 21.1 | 155.7 | 129.6 | 44.6 | 137.7 | 100.5 | 82.2 |
| Paper birch | 110.5 | 3.5 | 18.8 | 27.3 | -- | 20.1 | 15.2 | 25.6 |
| Exotic | 1.2 | -- | 1.2 | -- | -- | -- | -- | -- |
| Nonstocked | 40.2 | 7.7 | 2.4 | 0.7 | 5.9 | 7.7 | 2.5 | 13.3 |
| All types | 3,801.6 | 491.9 | 705.9 | 574.5 | 468.4 | 524.2 | 493.4 | 543.3 |

## Table 10.--Area of commercial forest land by county and stand-size class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| County | All stands | Stand-size class |  |  |  |
|---|---|---|---|---|---|
|  |  | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Alger | 491.9 | 212.6 | 194.5 | 77.1 | 7.7 |
| Chippewa | 705.9 | 173.5 | 378.6 | 151.4 | 2.4 |
| Delta | 574.5 | 99.2 | 329.4 | 145.2 | 0.7 |
| Luce | 468.4 | 179.8 | 163.3 | 119.4 | 5.9 |
| Mackinac | 524.2 | 122.1 | 283.2 | 111.3 | 7.6 |
| Menominee | 493.4 | 79.2 | 230.6 | 181.1 | 2.5 |
| Schoolcraft | 543.3 | 139.6 | 245.5 | 144.8 | 13.4 |
| All counties | 3,801.6 | 1,006.0 | 1,825.1 | 930.3 | 40.2 |

Table 11.--Area of commercial forest land by forest type, stand-size class, and site class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Jack pine | | | | | | | |
| Sawtimber | 38.1 | -- | -- | -- | 1.4 | 7.4 | 29.3 |
| Poletimber | 162.1 | -- | -- | -- | 1.6 | 22.7 | 137.8 |
| Sapling & seedling | 28.9 | -- | -- | -- | -- | 3.3 | 25.6 |
| All stands | 229.1 | -- | -- | -- | 3.0 | 33.4 | 192.7 |
| Red pine | | | | | | | |
| Sawtimber | 38.4 | -- | -- | -- | 13.4 | 19.2 | 5.8 |
| Poletimber | 59.8 | -- | -- | -- | 16.5 | 39.1 | 4.2 |
| Sapling & seedling | 41.6 | -- | -- | -- | 17.8 | 23.8 | -- |
| All stands | 139.8 | -- | -- | -- | 47.7 | 82.1 | 10.0 |
| White pine | | | | | | | |
| Sawtimber | 43.3 | -- | -- | 3.2 | 3.0 | 20.5 | 16.6 |
| Poletimber | 15.3 | -- | -- | -- | 1.5 | 5.9 | 7.9 |
| Sapling & seedling | 10.1 | -- | -- | -- | 1.9 | 1.8 | 6.4 |
| All stands | 68.7 | -- | -- | 3.2 | 6.4 | 28.2 | 30.9 |
| Balsam fir | | | | | | | |
| Sawtimber | 48.7 | -- | -- | 6.2 | 8.9 | 30.3 | 3.3 |
| Poletimber | 102.6 | -- | -- | 18.1 | 65.3 | 15.0 | 4.2 |
| Sapling & seedling | 66.1 | -- | -- | 9.2 | 27.6 | 17.3 | 12.0 |
| All stands | 217.4 | -- | -- | 33.5 | 101.8 | 62.6 | 19.5 |
| White spruce | | | | | | | |
| Sawtimber | 10.4 | -- | -- | -- | 4.6 | 4.3 | 1.5 |
| Poletimber | 10.5 | -- | -- | -- | 1.5 | 4.5 | 4.5 |
| Sapling & seedling | 9.2 | -- | -- | -- | 1.6 | 7.6 | -- |
| All stands | 30.1 | -- | -- | -- | 7.7 | 16.4 | 6.0 |
| Black spruce | | | | | | | |
| Sawtimber | 6.5 | -- | -- | -- | -- | -- | 6.5 |
| Poletimber | 149.7 | -- | -- | -- | 4.4 | 12.2 | 133.1 |
| Sapling & seedling | 126.9 | -- | -- | -- | 1.5 | 9.3 | 116.1 |
| All stands | 283.1 | -- | -- | -- | 5.9 | 21.5 | 255.7 |
| Northern white-cedar | | | | | | | |
| Sawtimber | 131.9 | -- | -- | -- | -- | 15.7 | 116.2 |
| Poletimber | 305.9 | -- | -- | -- | 4.6 | 19.5 | 281.8 |
| Sapling & seedling | 157.1 | -- | -- | -- | -- | 6.3 | 150.8 |
| All stands | 594.9 | -- | -- | -- | 4.6 | 41.5 | 548.8 |

(Table 11 continued on next page)

(Table 11 continued)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Tamarack | | | | | | | |
| Sawtimber | 1.4 | -- | -- | -- | -- | -- | 1.4 |
| Poletimber | 19.6 | -- | -- | -- | -- | 3.3 | 16.3 |
| Sapling & seedling | 22.8 | -- | -- | -- | -- | 3.2 | 19.6 |
| All stands | 43.8 | -- | -- | -- | -- | 6.5 | 37.3 |
| Oak-hickory | | | | | | | |
| Sawtimber | 6.3 | -- | -- | -- | -- | 6.3 | -- |
| Poletimber | 11.4 | -- | -- | -- | -- | 7.9 | 3.5 |
| Sapling & seedling | 1.6 | -- | -- | -- | -- | 1.6 | -- |
| All stands | 19.3 | -- | -- | -- | -- | 15.8 | 3.5 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 58.8 | -- | -- | -- | 1.5 | 6.2 | 51.1 |
| Poletimber | 70.7 | -- | -- | -- | -- | 11.5 | 59.2 |
| Sapling & seedling | 62.3 | -- | -- | -- | 1.5 | 8.0 | 52.8 |
| All stands | 191.8 | -- | -- | -- | 3.0 | 25.7 | 163.1 |
| Maple-birch | | | | | | | |
| Sawtimber | 519.0 | -- | -- | -- | 42.6 | 246.7 | 229.7 |
| Poletimber | 483.7 | -- | -- | 3.3 | 29.2 | 266.3 | 184.9 |
| Sapling & seedling | 157.6 | -- | -- | -- | 6.7 | 65.0 | 85.9 |
| All stands | 1,160.3 | -- | -- | 3.3 | 78.5 | 578.0 | 500.5 |
| Aspen | | | | | | | |
| Sawtimber | 93.6 | -- | -- | -- | 21.9 | 50.0 | 21.7 |
| Poletimber | 353.6 | -- | -- | 1.7 | 98.5 | 175.0 | 78.4 |
| Sapling & seedling | 224.2 | -- | -- | 3.3 | 34.2 | 113.0 | 73.7 |
| All stands | 671.4 | -- | -- | 5.0 | 154.6 | 338.0 | 173.8 |
| Paper birch | | | | | | | |
| Sawtimber | 9.6 | -- | -- | 2.0 | -- | 3.1 | 4.5 |
| Poletimber | 79.0 | -- | -- | 21.5 | -- | 29.5 | 28.0 |
| Sapling & seedling | 21.9 | -- | -- | -- | 1.5 | -- | 20.4 |
| All stands | 110.5 | -- | -- | 23.5 | 1.5 | 32.6 | 52.9 |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1.2 | -- | -- | -- | 1.2 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1.2 | -- | -- | -- | 1.2 | -- | -- |
| Nonstocked | 40.2 | -- | -- | 1.4 | 3.3 | 7.1 | 28.4 |
| All types | | | | | | | |
| Sawtimber | 1,006.0 | -- | -- | 11.4 | 97.3 | 409.7 | 487.6 |
| Poletimber | 1,825.1 | -- | -- | 44.6 | 224.3 | 612.4 | 943.8 |
| Sapling & seedling | 930.3 | -- | -- | 12.5 | 94.3 | 260.2 | 563.3 |
| Nonstocked | 40.2 | -- | -- | 1.4 | 3.3 | 7.1 | 28.4 |
| All stands | 3,801.6 | -- | -- | 69.9 | 419.2 | 1,289.4 | 2,023.1 |

Table 12.--Area of commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All ages | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 229.1 | 30.0 | 11.4 | 15.2 | 48.0 | 75.9 | 24.4 | 13.9 | 7.2 | 3.1 | -- | -- | -- | -- |
| Red pine | 139.8 | 16.4 | 29.5 | 23.0 | 34.5 | 11.4 | 4.9 | 6.0 | 7.6 | 1.5 | 1.6 | 3.4 | -- | -- |
| White pine | 68.7 | 5.1 | 3.3 | 3.2 | 3.3 | 4.4 | 8.7 | 11.0 | 9.0 | 2.2 | 3.6 | 7.3 | 4.5 | 3.1 |
| Balsam fir | 217.4 | 22.7 | 28.4 | 13.4 | 34.9 | 57.4 | 30.2 | 12.2 | 6.0 | 1.4 | 1.5 | 6.3 | 3.0 | -- |
| White spruce | 30.1 | 1.5 | 6.5 | 1.2 | -- | 8.9 | 3.1 | 1.6 | 2.8 | 3.0 | -- | 1.5 | -- | -- |
| Black spruce | 283.1 | 31.0 | 32.5 | 90.9 | 54.2 | 23.2 | 20.7 | 14.6 | 4.7 | 3.2 | 4.7 | 1.6 | -- | 1.8 |
| Northern white-cedar | 594.9 | 13.6 | 37.3 | 59.0 | 55.8 | 37.4 | 50.9 | 63.8 | 53.3 | 58.4 | 42.4 | 62.6 | 35.2 | 25.2 |
| Tamarack | 43.8 | 2.9 | 5.9 | 6.1 | 4.7 | 1.5 | 8.3 | 6.6 | 3.3 | 1.5 | 1.6 | 1.4 | -- | -- |
| Oak-hickory | 19.3 | -- | 1.7 | -- | 0.3 | 3.5 | 6.0 | 3.2 | -- | 1.5 | 1.5 | -- | 1.6 | -- |
| Elm-ash-soft maple | 191.8 | 24.5 | 18.7 | 16.0 | 10.0 | 20.9 | 26.3 | 12.0 | 14.0 | 9.9 | 13.2 | 16.3 | 7.0 | 3.0 |
| Maple-birch | 1,160.3 | 71.0 | 59.4 | 44.2 | 73.0 | 178.1 | 144.4 | 107.1 | 74.2 | 87.9 | 102.4 | 125.3 | 67.4 | 25.9 |
| Aspen | 671.4 | 142.3 | 71.9 | 28.4 | 109.0 | 123.3 | 92.0 | 51.6 | 12.3 | 12.0 | 20.1 | 8.5 | -- | -- |
| Paper birch | 110.5 | 16.0 | 7.8 | 3.2 | 4.8 | 16.2 | 23.4 | 25.4 | 7.6 | -- | 3.1 | 3.0 | -- | -- |
| Exotic | 1.2 | -- | -- | 1.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 40.2 | 25.8 | 3.0 | -- | 5.2 | 1.5 | 3.3 | -- | -- | 1.4 | -- | -- | -- | -- |
| All types | 3,801.6 | 402.8 | 317.3 | 305.0 | 437.7 | 563.6 | 446.6 | 329.0 | 202.0 | 187.0 | 195.7 | 237.2 | 118.7 | 59.0 |

Table 13.--Area of commercial forest land by forest type and site-index class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| Jack pine | 229.1 | -- | 11.8 | 60.4 | 48.3 | 76.7 | 25.1 | 5.2 | 1.6 | -- |
| Red pine | 139.8 | -- | -- | -- | 33.5 | 58.6 | 46.0 | 1.7 | -- | -- |
| White pine | 68.7 | -- | -- | 11.2 | 21.5 | 26.5 | 4.8 | 3.0 | 1.7 | -- |
| Balsam fir | 217.4 | 1.5 | 3.0 | 15.0 | 67.0 | 97.3 | 29.0 | 3.1 | -- | 1.5 |
| White spruce | 30.1 | -- | -- | 6.0 | 7.2 | 2.8 | 11.1 | 3.0 | -- | -- |
| Black spruce | 283.1 | -- | 13.4 | 127.7 | 114.6 | 21.5 | 4.4 | 1.5 | -- | -- |
| Northern white-cedar | 594.9 | 43.0 | 303.3 | 161.6 | 60.1 | 14.3 | 8.0 | 4.6 | -- | -- |
| Tamarack | 43.8 | -- | 4.6 | 19.2 | 13.6 | 4.8 | 1.6 | -- | -- | -- |
| Oak-hickory | 19.3 | -- | -- | 1.5 | 0.4 | 4.6 | 6.6 | 6.2 | -- | -- |
| Elm-ash-soft maple | 191.8 | -- | 1.5 | 25.2 | 54.0 | 57.7 | 39.6 | 10.8 | 3.0 | -- |
| Maple-birch | 1,160.3 | -- | 12.3 | 32.1 | 136.9 | 319.2 | 428.7 | 186.6 | 38.1 | 6.4 |
| Aspen | 671.4 | -- | -- | 25.9 | 77.2 | 157.9 | 204.3 | 160.8 | 40.3 | 5.0 |
| Paper birch | 110.5 | -- | -- | 6.3 | 13.8 | 47.6 | 36.6 | 4.7 | 1.5 | -- |
| Exotic | 1.2 | -- | -- | -- | -- | -- | 1.2 | -- | -- | -- |
| Nonstocked | 40.2 | 1.7 | 0.7 | 3.2 | 13.6 | 14.3 | 3.6 | 3.1 | -- | -- |
| All types | 3,801.6 | 46.2 | 350.6 | 495.3 | 661.7 | 903.8 | 850.6 | 394.3 | 86.2 | 12.9 |

Table 14.--Area of commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 38.1 | -- | -- | -- | 1.4 | 8.6 | 4.2 | 7.4 | 6.1 | 1.7 | 2.6 | 6.1 | -- | -- | -- |
| Poletimber | 162.1 | -- | 1.5 | 13.2 | 13.2 | 19.8 | 10.1 | 7.2 | 12.7 | 7.8 | 26.5 | 31.5 | 18.6 | -- | -- |
| Sapling & seedling | 28.9 | 12.2 | 7.2 | 1.5 | 6.1 | -- | -- | -- | 1.9 | -- | -- | -- | -- | -- | -- |
| All stands | 229.1 | 12.2 | 8.7 | 14.7 | 20.7 | 28.4 | 14.3 | 14.6 | 20.7 | 9.5 | 29.1 | 37.6 | 18.6 | -- | -- |
| Red pine | | | | | | | | | | | | | | |
| Sawtimber | 38.4 | -- | 1.9 | -- | 1.5 | 1.4 | 1.4 | 1.7 | 5.8 | -- | 5.7 | 6.7 | 7.8 | 3.0 | 1.5 |
| Poletimber | 59.8 | -- | -- | -- | -- | 2.3 | 1.8 | 2.9 | 18.9 | -- | -- | 16.8 | 2.1 | 7.5 | 7.5 |
| Sapling & seedling | 41.6 | -- | 5.7 | 4.7 | 14.9 | -- | 16.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 139.8 | -- | 7.6 | 4.7 | 16.4 | 3.7 | 19.5 | 4.6 | 24.7 | -- | 5.7 | 23.5 | 9.9 | 10.5 | 9.0 |
| White pine | | | | | | | | | | | | | | |
| Sawtimber | 43.3 | -- | -- | 1.4 | 1.7 | 1.7 | 3.0 | 1.5 | 10.0 | 0.8 | 6.6 | 13.5 | 1.7 | 1.4 | -- |
| Poletimber | 15.3 | -- | -- | -- | -- | 4.8 | 1.5 | 1.4 | -- | -- | -- | 7.6 | -- | -- | -- |
| Sapling & seedling | 10.1 | 1.5 | 3.4 | -- | 1.7 | -- | -- | 3.5 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 68.7 | 1.5 | 3.4 | 1.4 | 3.4 | 6.5 | 4.5 | 6.4 | 10.0 | 0.8 | 6.6 | 21.1 | 1.7 | 1.4 | -- |
| Balsam fir | | | | | | | | | | | | | | |
| Sawtimber | 48.7 | -- | -- | -- | -- | -- | 1.5 | -- | -- | 3.3 | 4.6 | 31.7 | 4.7 | -- | 2.9 |
| Poletimber | 102.6 | -- | -- | -- | 1.2 | 5.0 | -- | 3.1 | 18.7 | 9.2 | 21.7 | 16.5 | 15.3 | 5.8 | 6.1 |
| Sapling & seedling | 66.1 | 1.4 | 1.5 | 6.4 | 11.5 | 11.4 | 7.9 | 6.8 | 6.2 | 5.0 | 4.9 | 1.6 | 1.5 | -- | -- |
| All stands | 217.4 | 1.4 | 1.5 | 6.4 | 12.7 | 16.4 | 9.4 | 9.9 | 24.9 | 17.5 | 31.2 | 49.8 | 21.5 | 5.8 | 9.0 |
| White spruce | | | | | | | | | | | | | | |
| Sawtimber | 10.4 | -- | -- | -- | 1.5 | -- | -- | -- | -- | -- | -- | 1.5 | 1.5 | 2.9 | 3.0 |
| Poletimber | 10.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.1 | 1.5 | 4.4 | -- | 1.5 |
| Sapling & seedling | 9.2 | -- | 4.9 | -- | 1.6 | -- | -- | 2.7 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 30.1 | -- | 4.9 | -- | 3.1 | -- | -- | 2.7 | -- | -- | 3.1 | 3.0 | 5.9 | 2.9 | 4.5 |
| Black spruce | | | | | | | | | | | | | | |
| Sawtimber | 6.5 | -- | -- | -- | -- | -- | 1.8 | -- | 1.5 | 1.5 | -- | 1.7 | -- | -- | -- |
| Poletimber | 149.7 | 1.5 | -- | -- | 40.8 | 4.3 | 6.1 | 8.3 | 7.7 | 4.7 | 15.4 | 53.0 | 6.3 | 1.6 | -- |
| Sapling & seedling | 126.9 | 5.9 | 32.0 | 12.7 | 11.6 | 16.6 | 9.3 | 11.7 | 8.0 | 3.8 | 7.6 | 6.1 | 1.6 | -- | -- |
| All stands | 283.1 | 7.4 | 32.0 | 12.7 | 52.4 | 20.9 | 17.2 | 20.0 | 17.2 | 10.0 | 23.0 | 60.8 | 7.9 | 1.6 | -- |
| Northern white-cedar | | | | | | | | | | | | | | |
| Sawtimber | 131.9 | -- | -- | -- | 4.8 | 1.6 | 3.0 | 3.3 | 7.3 | -- | 2.8 | 31.3 | 24.4 | 29.8 | 23.6 |
| Poletimber | 305.9 | -- | -- | -- | 3.2 | 1.8 | 1.5 | 4.7 | 6.0 | 10.1 | 19.7 | 39.3 | 79.2 | 66.9 | 73.5 |
| Sapling & seedling | 157.1 | 4.5 | 7.8 | 3.4 | 7.5 | 8.5 | 7.2 | 16.5 | 16.9 | 6.1 | 8.9 | 18.5 | 28.2 | 21.5 | 1.6 |
| All stands | 594.9 | 4.5 | 7.8 | 3.4 | 15.5 | 11.9 | 11.7 | 24.5 | 30.2 | 16.2 | 31.4 | 89.1 | 131.8 | 118.2 | 98.7 |

(Table 14 continued on next page)

(Table 14 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 1.4 | -- | -- | -- | -- | -- | -- | -- | 1.4 | -- | -- | -- | -- | -- | -- |
| Poletimber | 19.6 | -- | -- | -- | 1.5 | 3.6 | 1.7 | 4.7 | 1.5 | 3.3 | 3.3 | -- | -- | -- | -- |
| Sapling & seedling | 22.8 | 1.2 | 1.5 | 1.4 | 3.0 | 3.2 | 4.5 | -- | 1.6 | 3.2 | 1.6 | -- | 1.6 | -- | -- |
| All stands | 43.8 | 1.2 | 1.5 | 1.4 | 4.5 | 6.8 | 6.2 | 4.7 | 4.5 | 6.5 | 4.9 | -- | 1.6 | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 6.3 | -- | -- | -- | 1.6 | -- | -- | 1.6 | 1.6 | -- | -- | 1.5 | -- | -- | -- |
| Poletimber | 11.4 | -- | -- | -- | -- | -- | 1.5 | 4.6 | 1.5 | 1.5 | 0.8 | 1.5 | -- | -- | -- |
| Sapling & seedling | 1.6 | -- | -- | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 19.3 | -- | -- | -- | 1.6 | -- | 1.5 | 7.8 | 3.1 | 1.5 | 0.8 | 3.0 | -- | -- | -- |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 58.8 | -- | -- | -- | -- | 3.7 | 1.5 | 1.5 | 12.5 | -- | 0.6 | 10.9 | 16.3 | 10.4 | 1.4 |
| Poletimber | 70.7 | -- | -- | -- | 2.6 | 4.7 | 2.6 | 7.8 | 4.8 | 1.5 | 15.1 | 6.0 | 20.2 | 5.4 | -- |
| Sapling & seedling | 62.3 | 1.0 | 6.4 | 4.8 | 6.5 | 4.7 | 9.4 | 11.3 | 4.4 | 3.0 | 4.7 | 3.1 | 3.0 | -- | -- |
| All stands | 191.8 | 1.0 | 6.4 | 4.8 | 9.1 | 13.1 | 13.5 | 20.6 | 21.7 | 4.5 | 20.4 | 20.0 | 39.5 | 15.8 | 1.4 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 519.0 | -- | 1.5 | -- | 5.2 | 3.2 | 1.8 | 20.5 | 54.6 | 47.9 | 73.7 | 126.5 | 117.2 | 44.8 | 22.1 |
| Poletimber | 483.7 | -- | 1.9 | 2.5 | 7.8 | 6.1 | 6.3 | 16.6 | 33.7 | 39.5 | 77.1 | 114.0 | 135.4 | 39.9 | 2.9 |
| Sapling & seedling | 157.6 | 10.4 | 3.3 | 7.0 | 12.8 | 27.6 | 13.5 | 27.2 | 21.7 | 17.0 | 4.5 | 11.2 | 1.4 | -- | -- |
| All stands | 1,160.3 | 10.4 | 6.7 | 9.5 | 25.8 | 36.9 | 21.6 | 64.3 | 110.0 | 104.4 | 155.3 | 251.7 | 254.0 | 84.7 | 25.0 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 93.6 | -- | -- | 2.1 | 1.5 | 18.9 | 1.5 | 5.4 | 10.1 | 6.0 | 9.0 | 3.0 | 21.2 | 7.6 | 7.3 |
| Poletimber | 353.6 | -- | 5.4 | 3.4 | 7.6 | 10.2 | 12.2 | 26.8 | 17.4 | 48.4 | 59.7 | 44.9 | 53.8 | 53.2 | 10.6 |
| Sapling & seedling | 224.2 | 23.2 | 32.2 | 50.3 | 35.5 | 35.7 | 20.1 | 6.2 | 8.8 | 4.4 | 4.8 | 1.5 | 1.5 | -- | -- |
| All stands | 671.4 | 23.2 | 37.6 | 55.8 | 44.6 | 64.8 | 33.8 | 38.4 | 36.3 | 58.8 | 73.5 | 49.4 | 76.5 | 60.8 | 17.9 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 9.6 | -- | -- | -- | -- | -- | -- | 3.1 | -- | -- | -- | 1.5 | 5.0 | -- | -- |
| Poletimber | 79.0 | -- | -- | -- | -- | 6.8 | 6.6 | 6.3 | 6.7 | -- | 25.5 | 12.1 | 9.1 | 2.9 | 3.0 |
| Sapling & seedling | 21.9 | 3.2 | -- | 3.2 | 3.1 | 4.9 | -- | 3.0 | 1.4 | 1.5 | 1.6 | -- | -- | -- | -- |
| All stands | 110.5 | 3.2 | -- | 3.2 | 3.1 | 11.7 | 6.6 | 12.4 | 8.1 | 1.5 | 27.1 | 13.6 | 14.1 | 2.9 | 3.0 |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 | -- | -- | -- |
| Nonstocked | 40.2 | 25.2 | 11.0 | 2.2 | 0.5 | 0.4 | 0.4 | -- | 0.5 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 1,006.0 | -- | 3.4 | 3.5 | 19.2 | 39.1 | 19.7 | 46.0 | 110.9 | 61.2 | 105.6 | 235.9 | 199.8 | 99.9 | 61.8 |
| Poletimber | 1,825.1 | 1.5 | 8.8 | 19.1 | 77.9 | 69.4 | 51.9 | 94.4 | 129.6 | 126.0 | 267.9 | 345.9 | 344.4 | 183.2 | 105.1 |
| Sapling & seedling | 930.3 | 64.5 | 105.9 | 95.4 | 115.8 | 112.6 | 88.2 | 90.5 | 70.9 | 44.0 | 38.6 | 42.0 | 38.8 | 21.5 | 1.6 |
| Nonstocked | 40.2 | 25.2 | 11.0 | 2.2 | 0.5 | 0.4 | 0.4 | -- | 0.5 | -- | -- | -- | -- | -- | -- |
| All stands | 3,801.6 | 91.2 | 129.1 | 120.2 | 213.4 | 221.5 | 160.2 | 230.9 | 311.9 | 231.2 | 412.1 | 623.8 | 583.0 | 304.6 | 168.5 |

## Table 15.--Area of commercial forest land by stocking class of growing-stock trees and stand-size class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | All stands | Stand-size class: Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
|---|---|---|---|---|---|
| Less than 16.7 | 40.2 | -- | -- | -- | 40.2 |
| 16.7 to 60.9 | 663.8 | 91.4 | 334.9 | 237.5 | -- |
| 61.0 to 100.9 | 1,381.5 | 402.6 | 666.5 | 312.4 | -- |
| 101.0 to 133.9 | 1,385.8 | 437.5 | 664.5 | 283.8 | -- |
| 134.0+ | 330.3 | 74.5 | 159.2 | 96.6 | -- |
| All classes | 3,801.6 | 1,006.0 | 1,825.1 | 930.3 | 40.2 |

## Table 16.--Area of commercial forest land by stocking class based on selected stand components, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | Stocking classified in terms of: All live trees | Growing stock trees | Desirable trees | Acceptable trees | Rough and rotten trees |
|---|---|---|---|---|---|
| 0-10 | 16.7 | 27.9 | 3,756.7 | 27.9 | 2,245.1 |
| 11-20 | 20.5 | 88.1 | 34.6 | 90.8 | 965.2 |
| 21-30 | 110.7 | 77.1 | 8.7 | 75.8 | 385.1 |
| 31-40 | 60.3 | 124.9 | 1.6 | 135.2 | 129.2 |
| 41-50 | 172.1 | 208.9 | -- | 200.5 | 52.2 |
| 51-60 | 151.5 | 177.1 | -- | 188.3 | 18.6 |
| 61-70 | 202.5 | 201.4 | -- | 201.9 | 3.1 |
| 71-80 | 158.6 | 265.6 | -- | 299.8 | 3.1 |
| 81-90 | 276.8 | 409.8 | -- | 401.1 | -- |
| 91-100 | 346.4 | 504.6 | -- | 520.3 | -- |
| 101-110 | 381.7 | 480.8 | -- | 467.9 | -- |
| 111-120 | 512.2 | 439.5 | -- | 441.0 | -- |
| 121-130 | 498.9 | 372.8 | -- | 354.1 | -- |
| 131-140 | 449.5 | 258.3 | -- | 247.7 | -- |
| 141-150 | 260.1 | 120.7 | -- | 108.4 | -- |
| 151-160 | 181.5 | 44.1 | -- | 40.9 | -- |
| 161+ | 1.6 | -- | -- | -- | -- |
| Total | 3,801.6 | 3,801.6 | 3,801.6 | 3,801.6 | 3,801.6 |

Table 17.--Area of noncommercial forest land by ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All areas | Productive-reserved areas | Unproductive areas |
|---|---|---|---|
| National Forest | 58.3 | 15.3[1] | 43.0 |
| Bureau of Land Management | -- | -- | -- |
| Indian | -- | -- | -- |
| Miscellaneous federal | 33.1 | 33.1 | -- |
| State | 113.6 | 77.6 | 36.0 |
| County and municipal | 1.7 | 0.1 | 1.6 |
| Forest industry | 6.1 | -- | 6.1 |
| Farmer | 6.5 | 1.5 | 5.0 |
| Misc. private-corp. | 4.8 | -- | 4.8 |
| Misc. private-indiv. | 5.9 | -- | 5.9 |
| Total | 230.0 | 127.6 | 102.4 |

[1] Includes 14.9 thousand acres of productive-deferred areas.

Table 18.--Area of noncommercial forest land by forest type, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All areas | Productive-reserved areas[1] | Unproductive areas |
|---|---|---|---|
| Jack pine | 2.2 | 1.3 | 0.9 |
| Red pine | 3.7 | 3.6 | 0.1 |
| White pine | 1.2 | 1.2 | -- |
| Balsam fir | 18.9 | 18.6 | 0.3 |
| White spruce | 4.6 | 3.1 | 1.5 |
| Black spruce | 50.1 | 3.7 | 46.4 |
| Northern white-cedar | 29.9 | 1.9 | 28.0 |
| Tamarack | 8.7 | -- | 8.7 |
| Oak-hickory | 0.7 | 0.7 | -- |
| Elm-ash-soft maple | 10.3 | 5.9 | 4.4 |
| Maple-birch | 41.2 | 40.5 | 0.7 |
| Aspen | 38.7 | 38.3 | 0.4 |
| Paper birch | 8.9 | 6.7 | 2.2 |
| Exotic | -- | -- | -- |
| Nonstocked | 10.9 | 2.1 | 8.8 |
| All types | 230.0 | 127.6 | 102.4 |

[1] Includes 14.9 thousand acres of productive-deferred areas.

Table 19.--Area of nonforest land with trees by forest type and land use, Eastern Upper Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All uses | Land use | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cropland | Improved pasture | Wooded strips | Idle farmland | Marsh | Wind-breaks | Urban and other windbreaks | Wooded pasture |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 1.8 | -- | -- | 1.8 | -- | -- | -- | -- | -- |
| White pine | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 3.4 | 1.7 | -- | -- | -- | 1.7 | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | 19.7 | -- | -- | 1.8 | -- | 17.9 | -- | -- | -- |
| Northern white-cedar | 9.8 | -- | -- | 1.9 | -- | 7.9 | -- | -- | -- |
| Tamarack | 3.5 | -- | -- | -- | -- | 3.5 | -- | -- | -- |
| Oak-hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm-ash-soft maple | 3.2 | -- | -- | -- | -- | 3.2 | -- | -- | -- |
| Maple-birch | 10.3 | 1.7 | 1.5 | 5.4 | -- | 1.7 | -- | -- | -- |
| Aspen | 29.7 | -- | 1.0 | 14.0 | 1.8 | 11.2 | 1.7 | -- | -- |
| Paper birch | 1.9 | -- | -- | -- | -- | 1.9 | -- | -- | -- |
| Exotic | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 83.3 | 3.4 | 2.5 | 24.9 | 1.8 | 49.0 | 1.7 | -- | -- |

Table 20.--Number of all live trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 23,900 | 9,518 | 3,493 | 3,035 | 2,011 | 1,503 | 1,374 | 1,230 | 689 | 331 | 338 | 193 | 153 | 32 | -- |
| Red pine | 46,176 | 11,404 | 14,660 | 8,867 | 6,695 | 2,032 | 1,172 | 507 | 542 | 191 | 67 | 24 | 15 | -- | -- |
| Jack pine | 69,026 | 12,451 | 15,887 | 20,229 | 14,037 | 4,860 | 1,056 | 337 | 78 | 88 | 3 | -- | -- | -- | -- |
| White spruce | 43,221 | 15,688 | 7,626 | 9,335 | 4,260 | 3,577 | 1,597 | 706 | 220 | 152 | 31 | 22 | 7 | -- | -- |
| Black spruce | 199,412 | 90,819 | 60,825 | 35,679 | 9,388 | 2,107 | 415 | 56 | 38 | 8 | 77 | -- | -- | -- | -- |
| Balsam fir | 446,880 | 277,420 | 100,653 | 47,311 | 15,394 | 4,216 | 1,394 | 408 | 60 | 24 | -- | -- | -- | -- | -- |
| Hemlock | 36,599 | 12,549 | 8,115 | 4,130 | 3,748 | 2,648 | 1,971 | 1,535 | 1,014 | 374 | 238 | 158 | 115 | 4 | -- |
| Tamarack | 47,308 | 22,741 | 14,942 | 6,540 | 1,884 | 921 | 185 | 69 | 22 | 4 | -- | -- | -- | -- | -- |
| Northern white-cedar | 535,697 | 234,367 | 150,778 | 86,424 | 38,444 | 15,924 | 6,093 | 2,317 | 826 | 306 | 120 | 49 | 41 | 6 | 2 |
| Other softwoods | 941 | 117 | 470 | 187 | 119 | 48 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,449,160 | 687,074 | 377,449 | 221,737 | 95,980 | 37,836 | 15,257 | 7,165 | 3,489 | 1,478 | 874 | 446 | 331 | 42 | 2 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 304 | 265 | -- | -- | -- | 33 | -- | 6 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 4,774 | 1,235 | 883 | 1,010 | 603 | 491 | 233 | 145 | 86 | 40 | 22 | 17 | 9 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 32,639 | 14,449 | 6,177 | 3,962 | 2,195 | 1,995 | 1,358 | 1,073 | 659 | 381 | 155 | 123 | 92 | 18 | 2 |
| Hard maple | 327,784 | 188,275 | 68,868 | 29,638 | 19,291 | 10,148 | 5,431 | 2,960 | 1,779 | 813 | 327 | 127 | 100 | 27 | -- |
| Soft maple | 293,373 | 145,458 | 69,477 | 36,967 | 21,258 | 10,317 | 5,008 | 2,784 | 1,125 | 607 | 230 | 76 | 60 | 6 | -- |
| Beech | 67,613 | 40,410 | 9,402 | 5,999 | 3,414 | 2,498 | 2,136 | 1,776 | 991 | 613 | 219 | 84 | 69 | 2 | -- |
| Ash | 121,189 | 74,000 | 31,494 | 10,138 | 3,196 | 1,362 | 649 | 250 | 52 | 29 | 17 | -- | -- | 2 | -- |
| Balsam poplar | 46,879 | 20,028 | 11,116 | 6,071 | 3,850 | 2,641 | 1,571 | 965 | 387 | 145 | 79 | 24 | 2 | -- | -- |
| Cottonwood | 15 | -- | -- | -- | -- | -- | -- | 11 | 4 | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 14,645 | 2,267 | 2,531 | 3,434 | 3,453 | 1,778 | 594 | 402 | 103 | 69 | 12 | 2 | -- | -- | -- |
| Quaking aspen | 183,331 | 87,860 | 34,212 | 27,482 | 16,799 | 9,459 | 4,679 | 1,770 | 723 | 255 | 66 | 24 | 2 | -- | -- |
| Basswood | 11,642 | 2,659 | 2,700 | 2,300 | 1,493 | 1,225 | 790 | 275 | 108 | 56 | 23 | 9 | 4 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 33,036 | 15,168 | 7,319 | 5,348 | 2,821 | 1,092 | 952 | 236 | 74 | 16 | 8 | 2 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 14,002 | 5,951 | 2,548 | 2,232 | 1,386 | 799 | 430 | 365 | 149 | 92 | 28 | 12 | 7 | 3 | -- |
| Paper birch | 111,347 | 35,024 | 32,035 | 21,843 | 13,173 | 5,748 | 2,320 | 847 | 265 | 58 | 21 | 5 | 8 | -- | -- |
| Other hardwoods | 325 | 302 | -- | -- | 17 | -- | -- | 6 | -- | -- | -- | -- | -- | -- | -- |
| Noncommercial species | 47,336 | 37,137 | 7,438 | 1,821 | 628 | 246 | 54 | 12 | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,310,234 | 670,488 | 286,200 | 158,245 | 93,577 | 49,832 | 26,205 | 13,883 | 6,505 | 3,174 | 1,207 | 505 | 353 | 58 | 2 |
| All species | 2,759,394 | 1,357,562 | 663,649 | 379,982 | 189,557 | 87,668 | 41,462 | 21,048 | 9,994 | 4,652 | 2,081 | 951 | 684 | 100 | 4 |

Table 21.--Number of growing-stock trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 22,656 | 9,519 | 3,493 | 2,636 | 1,714 | 1,290 | 1,160 | 1,186 | 667 | 302 | 318 | 193 | 147 | 31 | -- |
| Red pine | 45,892 | 11,404 | 14,523 | 8,752 | 6,683 | 2,012 | 1,172 | 507 | 542 | 191 | 67 | 24 | 15 | -- | -- |
| Jack pine | 66,717 | 12,010 | 15,748 | 19,638 | 13,215 | 4,578 | 1,032 | 330 | 74 | 89 | 3 | -- | -- | -- | -- |
| White spruce | 40,034 | 15,523 | 7,626 | 6,462 | 4,194 | 3,536 | 1,567 | 706 | 220 | 143 | 28 | 22 | 7 | -- | -- |
| Black spruce | 195,675 | 87,860 | 60,667 | 35,261 | 9,269 | 2,032 | 407 | 56 | 38 | 8 | 77 | -- | -- | -- | -- |
| Balsam fir | 437,343 | 272,009 | 98,355 | 46,353 | 14,846 | 4,082 | 1,282 | 336 | 60 | 20 | -- | -- | -- | -- | -- |
| Hemlock | 33,026 | 11,802 | 7,671 | 3,260 | 3,297 | 2,225 | 1,668 | 1,405 | 897 | 344 | 201 | 142 | 110 | 4 | -- |
| Tamarack | 44,571 | 21,403 | 14,166 | 6,136 | 1,754 | 853 | 164 | 69 | 22 | 4 | -- | -- | -- | -- | -- |
| Northern white-cedar | 486,791 | 218,140 | 139,456 | 76,739 | 32,636 | 12,513 | 4,670 | 1,712 | 625 | 183 | 70 | 22 | 23 | 2 | -- |
| Other softwoods | 913 | 117 | 470 | 159 | 119 | 48 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,373,618 | 659,787 | 362,175 | 205,396 | 87,727 | 33,169 | 13,122 | 6,307 | 3,145 | 1,284 | 764 | 403 | 302 | 37 | -- |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 290 | 264 | -- | -- | -- | 20 | -- | 6 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 4,274 | 1,234 | 732 | 797 | 526 | 480 | 210 | 139 | 82 | 40 | 19 | 11 | 4 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 25,824 | 11,236 | 5,105 | 3,243 | 1,762 | 1,591 | 1,011 | 816 | 543 | 278 | 93 | 82 | 52 | 10 | 2 |
| Hard maple | 306,285 | 176,887 | 63,774 | 27,709 | 18,310 | 9,396 | 4,751 | 2,625 | 1,626 | 721 | 299 | 111 | 69 | 7 | -- |
| Soft maple | 261,301 | 130,370 | 61,688 | 32,955 | 18,827 | 8,983 | 4,350 | 2,418 | 894 | 518 | 204 | 55 | 37 | 2 | -- |
| Beech | 60,559 | 37,728 | 8,680 | 5,125 | 2,520 | 2,012 | 1,616 | 1,375 | 827 | 437 | 161 | 49 | 27 | 2 | -- |
| Ash | 103,166 | 63,245 | 26,270 | 8,787 | 2,775 | 1,254 | 535 | 218 | 43 | 22 | 17 | -- | -- | -- | -- |
| Balsam poplar | 43,284 | 18,518 | 10,241 | 5,707 | 3,564 | 2,435 | 1,412 | 806 | 369 | 139 | 71 | 22 | -- | -- | -- |
| Cottonwood | 15 | -- | -- | -- | -- | -- | -- | 11 | 4 | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 12,989 | 1,657 | 2,372 | 3,106 | 3,194 | 1,651 | 546 | 318 | 74 | 62 | 9 | -- | -- | -- | -- |
| Quaking aspen | 164,021 | 81,568 | 30,508 | 23,465 | 14,672 | 7,815 | 3,977 | 1,398 | 421 | 125 | 52 | 18 | 2 | -- | -- |
| Basswood | 10,744 | 2,368 | 2,559 | 2,149 | 1,406 | 1,133 | 708 | 248 | 92 | 53 | 18 | 6 | 4 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 23,514 | 13,639 | 2,968 | 2,856 | 2,173 | 836 | 779 | 192 | 54 | 10 | 5 | 2 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 12,475 | 5,372 | 2,408 | 1,837 | 1,186 | 687 | 407 | 324 | 136 | 81 | 24 | 9 | 3 | 1 | -- |
| Paper birch | 100,133 | 32,353 | 27,548 | 19,868 | 12,009 | 5,233 | 2,113 | 734 | 219 | 42 | 5 | 5 | 4 | -- | -- |
| Other hardwoods | 325 | 302 | -- | -- | 17 | -- | -- | 6 | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,129,199 | 576,741 | 244,853 | 137,604 | 82,941 | 43,526 | 22,415 | 11,634 | 5,384 | 2,528 | 977 | 370 | 202 | 22 | 2 |
| All species | 2,502,817 | 1,236,528 | 607,028 | 343,000 | 170,668 | 76,695 | 35,537 | 17,941 | 8,529 | 3,812 | 1,741 | 773 | 504 | 59 | 2 |

Table 22.--Number of short-log trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 157 | 78 | 42 | 23 | 9 | -- | 3 | -- | 2 | -- | -- |
| Red pine | 20 | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 162 | 143 | 10 | 4 | 5 | -- | -- | -- | -- | -- | -- |
| White spruce | 38 | 21 | 8 | -- | -- | 6 | 3 | -- | -- | -- | -- |
| Black spruce | 66 | 57 | 9 | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 153 | 64 | 75 | 10 | -- | 4 | -- | -- | -- | -- | -- |
| Hemlock | 272 | 117 | 66 | 39 | 21 | 9 | 14 | 2 | 4 | -- | -- |
| Tamarack | 20 | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 1,000 | 487 | 247 | 155 | 48 | 24 | 27 | 4 | 7 | 1 | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,888 | 1,007 | 457 | 231 | 83 | 43 | 47 | 6 | 13 | 1 | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 33 | -- | 15 | 6 | 4 | -- | -- | 6 | 2 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 300 | -- | 139 | 66 | 34 | 31 | 14 | 4 | 8 | 4 | -- |
| Hard maple | 650 | -- | 388 | 127 | 58 | 43 | 17 | 5 | 9 | 3 | -- |
| Soft maple | 405 | -- | 173 | 83 | 93 | 33 | 3 | 14 | 6 | -- | -- |
| Beech | 289 | -- | 112 | 77 | 28 | 27 | 20 | 11 | 14 | -- | -- |
| Ash | 99 | -- | 66 | 20 | 10 | 3 | -- | -- | -- | -- | -- |
| Balsam poplar | 59 | -- | 43 | 8 | -- | 3 | 5 | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 26 | -- | 8 | -- | 12 | 4 | -- | 2 | -- | -- | -- |
| Quaking aspen | 310 | -- | 169 | 103 | 29 | 7 | -- | 2 | -- | -- | -- |
| Basswood | 47 | -- | 21 | 17 | 7 | -- | -- | 2 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 41 | -- | 18 | 16 | 4 | 3 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 3 | -- | -- | -- | -- | 3 | -- | -- | -- | -- | -- |
| Paper birch | 157 | -- | 81 | 42 | 17 | 6 | 9 | -- | 2 | -- | -- |
| Other hardwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 2,419 | -- | 1,233 | 565 | 296 | 163 | 68 | 46 | 41 | 7 | -- |
| All species | 4,307 | 1,007 | 1,690 | 796 | 379 | 206 | 115 | 52 | 54 | 8 | -- |

Table 23.--Net volume of growing stock on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1966 and 1980

(In million cubic feet)

| Species group | 1966 | 1980 |
|---|---|---|
| SOFTWOODS | | |
| White pine | 111.0 | 146.1 |
| Red pine | 109.6 | 138.9 |
| Jack pine | 137.4 | 174.3 |
| White spruce | 97.7 | 148.6 |
| Black spruce | 104.1 | 171.0 |
| Balsam fir | 266.2 | 259.3 |
| Hemlock | 147.1 | 133.4 |
| Tamarack | 30.2 | 42.5 |
| Northern white-cedar | 445.8 | 532.9 |
| Other softwoods | -- | 1.4 |
| Total | 1,449.1 | 1,748.3 |
| HARDWOODS | | |
| Select white oak | 0.2 | 0.4 |
| Select red oak | 17.0 | 21.7 |
| Other red oak | -- | -- |
| Hickory | -- | -- |
| Yellow birch | 122.2 | 99.7 |
| Hard maple | 480.3 | 536.4 |
| Soft maple | 289.3 | 477.5 |
| Beech | 195.6 | 168.3 |
| Ash | 47.5 | 66.6 |
| Balsam poplar | 68.4 | 89.7 |
| Cottonwood | 0.5 | 0.4 |
| Bigtooth aspen | 68.1 | 66.6 |
| Quaking aspen | 265.0 | 363.8 |
| Basswood | 71.2 | 50.4 |
| Yellow-poplar | -- | -- |
| Black walnut | -- | -- |
| Black cherry | 25.4 | 49.7 |
| Butternut | -- | -- |
| Elm | 100.3 | 41.2 |
| Paper birch | 203.0 | 253.9 |
| Other hardwoods | -- | 0.2 |
| Total | 1,954.0 | 2,286.5 |
| All species | 3,403.1 | 4,034.7 |

Table 24.--Net volume of all live trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 152,530 | 5,698 | 8,181 | 11,396 | 16,252 | 24,321 | 19,992 | 12,981 | 17,978 | 13,892 | 16,345 | 5,494 | -- |
| Red pine | 139,208 | 21,791 | 36,014 | 19,795 | 18,467 | 12,072 | 17,216 | 7,887 | 3,316 | 1,558 | 1,092 | -- | -- |
| Jack pine | 179,425 | 47,903 | 67,024 | 39,813 | 13,666 | 6,168 | 1,911 | 2,847 | 93 | -- | -- | -- | -- |
| White spruce | 152,854 | 20,858 | 25,924 | 39,281 | 28,369 | 18,738 | 8,088 | 7,379 | 1,764 | 1,741 | 712 | -- | -- |
| Black spruce | 172,178 | 86,775 | 50,792 | 19,777 | 6,732 | 1,435 | 1,292 | 415 | 4,960 | -- | -- | -- | -- |
| Balsam fir | 264,271 | 111,975 | 79,081 | 40,454 | 21,034 | 8,486 | 2,129 | 1,112 | -- | -- | -- | -- | -- |
| Hemlock | 144,457 | 7,315 | 14,319 | 17,410 | 20,561 | 24,952 | 23,016 | 11,281 | 9,131 | 7,712 | 8,123 | 551 | 86 |
| Tamarack | 43,578 | 16,398 | 11,727 | 10,257 | 2,953 | 1,544 | 593 | 106 | -- | -- | -- | -- | -- |
| Northern white-cedar | 585,294 | 185,276 | 159,268 | 108,463 | 63,175 | 34,267 | 17,189 | 7,976 | 4,285 | 1,935 | 2,479 | 669 | 312 |
| Other softwoods | 1,477 | 461 | 660 | 356 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,835,272 | 504,450 | 452,990 | 307,002 | 191,209 | 131,983 | 91,426 | 51,984 | 41,527 | 26,838 | 28,751 | 6,714 | 398 |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 460 | -- | -- | 341 | | 119 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 23,554 | 2,320 | 3,293 | 4,695 | 3,488 | 3,181 | 2,519 | 1,570 | 957 | 951 | 580 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 119,326 | 9,339 | 10,508 | 16,439 | 16,081 | 19,029 | 15,976 | 11,848 | 5,918 | 5,869 | 5,913 | 1,914 | 493 |
| Hard maple | 574,072 | 86,300 | 115,830 | 102,775 | 85,163 | 65,513 | 53,473 | 31,754 | 15,893 | 7,426 | 6,960 | 2,985 | -- |
| Soft maple | 524,530 | 100,560 | 122,208 | 101,992 | 74,170 | 58,061 | 29,967 | 20,614 | 9,684 | 3,427 | 3,375 | 472 | -- |
| Beech | 201,732 | 18,329 | 20,760 | 25,753 | 32,798 | 37,722 | 28,001 | 20,964 | 9,245 | 4,029 | 3,904 | 227 | -- |
| Ash | 71,999 | 25,447 | 15,867 | 12,685 | 9,206 | 5,030 | 1,555 | 1,079 | 853 | -- | -- | 277 | -- |
| Balsam poplar | 94,115 | 9,443 | 13,820 | 17,290 | 16,985 | 15,705 | 10,264 | 5,078 | 3,890 | 1,527 | 113 | -- | -- |
| Cottonwood | 368 | -- | -- | -- | -- | 238 | 130 | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 71,097 | 10,409 | 20,771 | 17,101 | 9,123 | 7,882 | 2,745 | 2,459 | 523 | 84 | -- | -- | -- |
| Quaking aspen | 409,036 | 79,747 | 99,266 | 92,613 | 70,300 | 37,198 | 18,102 | 7,535 | 2,862 | 1,286 | 127 | -- | -- |
| Basswood | 53,114 | 6,706 | 8,608 | 12,024 | 12,333 | 6,191 | 3,238 | 2,211 | 1,064 | 484 | 255 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 59,735 | 11,476 | 15,461 | 10,891 | 14,145 | 5,107 | 1,822 | 466 | 276 | 91 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 44,799 | 5,839 | 7,382 | 7,453 | 6,508 | 7,630 | 4,092 | 3,348 | 1,173 | 613 | 430 | 331 | -- |
| Paper birch | 273,735 | 75,649 | 81,775 | 56,784 | 33,849 | 16,129 | 6,525 | 1,860 | 562 | 261 | 341 | -- | -- |
| Other hardwoods | 239 | -- | 104 | -- | -- | 135 | -- | -- | -- | -- | -- | -- | -- |
| Noncommercial species | 9,482 | 4,049 | 2,732 | 1,873 | 629 | 199 | -- | -- | -- | -- | -- | -- | -- |
| Total | 2,531,393 | 445,613 | 538,385 | 480,709 | 384,778 | 285,069 | 178,409 | 110,786 | 52,900 | 26,047 | 21,998 | 6,206 | 493 |
| All species | 4,366,665 | 950,063 | 991,375 | 787,711 | 575,987 | 417,052 | 269,835 | 162,770 | 94,427 | 52,885 | 50,749 | 12,920 | 891 |

Table 25.--Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Class of timber | All species | Softwoods | Hardwoods |
|---|---|---|---|
| LIVE TREES | | | |
| Growing-stock trees | | | |
| Sawtimber | | | |
| Saw log portion | 1,550,826 | 725,132 | 825,694 |
| Upper stem portion | 216,503 | 100,463 | 116,040 |
| Subtotal | 1,767,329 | 825,595 | 941,734 |
| Poletimber | 2,267,415 | 922,689 | 1,344,726 |
| Total | 4,034,744 | 1,748,284 | 2,286,460 |
| Cull trees | | | |
| Rough and rotten cull trees | | | |
| Sawtimber | 118,793 | 35,441 | 83,352 |
| Poletimber | 154,731 | 34,751 | 119,980 |
| Subtotal | 273,524 | 70,192 | 203,332 |
| Short-log trees | 58,397 | 16,796 | 41,601 |
| Total | 331,921 | 86,988 | 244,933 |
| TOTAL LIVE TREES | 4,366,665 | 1,835,272 | 2,531,393 |
| SALVABLE DEAD TREES | 167,245 | 81,639 | 85,606 |
| ALL CLASSES | 4,533,910 | 1,916,911 | 2,616,999 |

Table 26.--Net volume of growing stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species, Eastern Upper Peninsula, Michigan, 1980

| Species | Total all live | Growing stock | Short-log cull | Rough and rotten cull | Sawtimber |
|---|---|---|---|---|---|
| | - - - - - - - - -Thousand cubic feet- - - - - - - - - | | | | Thousand board feet[1/] |
| SOFTWOODS | | | | | |
| White pine | 152,530 | 146,073 | 1,458 | 4,999 | 736,589 |
| Red pine | 139,208 | 138,860 | 110 | 238 | 447,746 |
| Jack pine | 179,425 | 174,266 | 1,004 | 4,155 | 309,368 |
| Scotch pine | 1,396 | 1,359 | -- | 37 | 1,602 |
| White spruce | 152,854 | 148,642 | 435 | 3,777 | 527,783 |
| Norway spruce | -- | -- | -- | -- | -- |
| Engelmann spruce | 81 | 81 | -- | -- | -- |
| Black spruce | 172,178 | 170,997 | 360 | 821 | 169,698 |
| Balsam fir | 264,271 | 259,257 | 1,322 | 3,692 | 323,226 |
| Hemlock | 144,457 | 133,434 | 2,884 | 8,139 | 661,391 |
| Tamarack | 43,578 | 42,467 | 123 | 988 | 66,942 |
| Northern white-cedar | 585,294 | 532,848 | 9,100 | 43,346 | 996,280 |
| Eastern redcedar | -- | -- | -- | -- | -- |
| Total | 1,835,272 | 1,748,284 | 16,796 | 70,192 | 4,240,625 |
| HARDWOODS | | | | | |
| White oak | 109 | 109 | -- | -- | -- |
| Bur oak | 351 | 249 | -- | 102 | 637 |
| Swamp white oak | -- | -- | -- | -- | -- |
| Northern red oak | 23,554 | 21,707 | 811 | 1,036 | 65,731 |
| Shellbark hickory | -- | -- | -- | -- | -- |
| Yellow birch | 119,326 | 99,743 | 5,090 | 14,493 | 367,659 |
| Black maple | -- | -- | -- | -- | -- |
| Sugar maple | 574,072 | 536,418 | 11,404 | 26,250 | 1,366,336 |
| Red maple | 524,116 | 477,039 | 7,212 | 39,865 | 945,765 |
| Silver maple | 414 | 414 | -- | -- | 1,278 |
| American beech | 201,732 | 168,298 | 6,340 | 27,094 | 653,154 |
| White ash | 17,348 | 16,865 | 373 | 110 | 32,666 |
| Black ash | 48,623 | 44,349 | 682 | 3,592 | 44,101 |
| Green ash | 6,028 | 5,427 | 262 | 339 | 11,329 |
| Balsam poplar | 94,115 | 89,733 | 834 | 3,548 | 278,417 |
| Paper birch | 273,735 | 253,926 | 2,365 | 17,444 | 287,113 |
| Bigtooth aspen | 71,097 | 66,570 | 482 | 4,045 | 112,159 |
| Quaking aspen | 409,036 | 363,836 | 4,210 | 40,990 | 638,290 |
| Basswood | 53,114 | 50,367 | 829 | 1,918 | 132,115 |
| American elm | 42,342 | 38,701 | 105 | 3,536 | 123,331 |
| Slippery elm | 122 | 122 | -- | -- | 680 |
| Rock elm | 2,335 | 2,335 | -- | -- | -- |
| Black cherry | 59,735 | 49,645 | 602 | 9,488 | 91,220 |
| Boxelder | -- | -- | -- | -- | -- |
| River birch | -- | -- | -- | -- | -- |
| Sweet birch | 104 | 104 | -- | -- | -- |
| Eastern cottonwood | 368 | 368 | -- | -- | 1,936 |
| Black willow | -- | -- | -- | -- | -- |
| Ohio buckeye | 135 | 135 | -- | -- | 665 |
| Flowering dogwood | -- | -- | -- | -- | -- |
| Black locust | -- | -- | -- | -- | -- |
| Noncommercial species | 9,482 | -- | -- | 9,482 | -- |
| Total | 2,531,393 | 2,286,460 | 41,601 | 203,332 | 5,154,582 |
| All species | 4,366,665 | 4,034,744 | 58,397 | 273,524 | 9,395,207 |

[1/] International 1/4-inch rule.

Table 27.--Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species | Nongrowing-stock (rough tree) volume |
|---|---|
| Striped maple | 827 |
| Mountain maple | 90 |
| Ailanthus | -- |
| American hornbeam | -- |
| Eastern hophornbeam | 8,020 |
| Eastern redbud | -- |
| Hawthorn | -- |
| Apple | 157 |
| Pin cherry | 239 |
| Chokecherry | -- |
| Mountain ash | 149 |
| Peachleaf willow | -- |
| Diamond willow | -- |
| All species | 9,482 |

Table 28.--Net volume of growing stock on commercial forest land by county and species group, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All counties | County | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| SOFTWOODS | | | | | | | | |
| White pine | 146,073 | 20,170 | 18,471 | 12,848 | 34,251 | 13,821 | 17,027 | 29,485 |
| Red pine | 138,860 | 16,613 | 27,655 | 27,691 | 20,669 | 17,617 | 1,926 | 26,689 |
| Jack pine | 174,266 | 10,757 | 67,334 | 25,088 | 26,079 | 13,747 | 1,616 | 29,645 |
| White spruce | 148,642 | 19,816 | 32,046 | 29,901 | 10,915 | 35,310 | 7,240 | 13,414 |
| Black spruce | 170,997 | 9,002 | 47,159 | 27,395 | 21,843 | 27,915 | 11,071 | 26,612 |
| Balsam fir | 259,257 | 31,293 | 47,266 | 52,136 | 31,024 | 45,228 | 22,675 | 29,635 |
| Hemlock | 133,434 | 38,512 | 12,343 | 17,751 | 25,913 | 9,038 | 11,626 | 18,251 |
| Tamarack | 42,467 | 750 | 4,528 | 4,640 | 6,302 | 5,495 | 13,496 | 7,256 |
| Northern white-cedar | 532,848 | 56,335 | 77,642 | 81,695 | 64,408 | 82,242 | 102,783 | 67,743 |
| Other softwoods | 1,440 | -- | 1,052 | -- | 307 | -- | -- | 81 |
| Total | 1,748,284 | 203,248 | 335,496 | 279,145 | 241,711 | 250,413 | 189,460 | 248,811 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 358 | -- | -- | -- | -- | -- | 358 | -- |
| Select red oaks | 21,707 | 72 | 6,765 | 1,996 | 819 | 1,733 | 10,236 | 86 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 99,743 | 30,148 | 17,938 | 13,657 | 10,814 | 9,940 | 4,595 | 12,651 |
| Hard maple | 536,418 | 154,397 | 75,681 | 49,016 | 69,793 | 70,754 | 66,268 | 50,509 |
| Soft maple | 477,453 | 105,298 | 75,844 | 62,394 | 83,532 | 51,146 | 28,540 | 70,699 |
| Beech | 168,298 | 59,185 | 29,648 | 9,459 | 33,601 | 16,138 | 2,480 | 17,787 |
| Ash | 66,641 | 7,661 | 7,451 | 14,807 | 3,126 | 3,983 | 25,340 | 4,273 |
| Balsam poplar | 89,733 | 2,353 | 21,008 | 20,345 | 3,257 | 23,478 | 12,151 | 7,141 |
| Cottonwood | 368 | -- | 368 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 66,570 | 4,074 | 13,246 | 12,106 | 4,880 | 17,584 | 6,871 | 7,809 |
| Quaking aspen | 363,836 | 16,468 | 96,298 | 69,496 | 32,514 | 68,589 | 47,301 | 33,170 |
| Basswood | 50,367 | 6,112 | 4,855 | 6,807 | 1,371 | 7,785 | 21,293 | 2,144 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 49,645 | 17,271 | 5,626 | 4,837 | 5,762 | 4,722 | 2,114 | 9,313 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 41,158 | 17,501 | 2,807 | 6,019 | 915 | 4,478 | 7,712 | 1,726 |
| Paper birch | 253,926 | 9,245 | 48,493 | 45,169 | 17,567 | 61,157 | 34,025 | 38,270 |
| Other hardwoods | 239 | 135 | 104 | -- | -- | -- | -- | -- |
| Total | 2,286,460 | 429,920 | 406,132 | 316,108 | 267,951 | 341,487 | 269,284 | 255,578 |
| All species | 4,034,744 | 633,168 | 741,628 | 595,253 | 509,662 | 591,900 | 458,744 | 504,389 |

Table 29.--Net volume of sawtimber on commercial forest land by county and species group, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All counties | County |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 736,589 | 106,506 | 95,818 | 65,892 | 171,008 | 68,717 | 85,728 | 142,920 |
| Red pine | 447,746 | 47,672 | 78,218 | 74,418 | 87,859 | 57,362 | 7,672 | 94,545 |
| Jack pine | 309,368 | 17,428 | 107,336 | 42,419 | 48,449 | 33,549 | 429 | 59,758 |
| White spruce | 527,783 | 71,487 | 114,980 | 109,150 | 34,638 | 122,132 | 29,812 | 45,584 |
| Black spruce | 169,698 | 13,042 | 52,534 | 23,767 | 21,229 | 29,627 | 6,081 | 23,418 |
| Balsam fir | 323,226 | 37,449 | 57,445 | 59,752 | 49,451 | 58,284 | 21,103 | 39,742 |
| Hemlock | 661,391 | 199,234 | 64,050 | 77,804 | 135,634 | 43,085 | 52,910 | 88,674 |
| Tamarack | 66,942 | 2,421 | 10,529 | 7,207 | 12,407 | 10,241 | 11,474 | 12,663 |
| Northern white-cedar | 996,280 | 153,667 | 158,395 | 113,780 | 177,581 | 132,121 | 150,605 | 110,131 |
| Other softwoods | 1,602 | -- | 912 | -- | 690 | -- | -- | -- |
| Total | 4,240,625 | 648,906 | 740,217 | 574,189 | 738,946 | 555,118 | 365,814 | 617,435 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 637 | -- | -- | -- | -- | -- | 637 | -- |
| Select red oaks | 65,731 | -- | 22,147 | 8,531 | 546 | 2,236 | 32,271 | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 367,659 | 116,722 | 63,885 | 45,425 | 44,987 | 34,927 | 9,701 | 52,012 |
| Hard maple | 1,366,336 | 452,443 | 162,544 | 116,505 | 223,358 | 177,115 | 109,642 | 124,729 |
| Soft maple | 947,043 | 234,842 | 166,851 | 76,781 | 194,900 | 85,204 | 47,813 | 140,652 |
| Beech | 653,154 | 241,466 | 120,172 | 35,689 | 137,336 | 47,474 | 8,757 | 62,260 |
| Ash | 88,096 | 12,571 | 9,650 | 18,590 | 2,219 | 6,513 | 33,966 | 4,587 |
| Balsam poplar | 278,417 | 6,863 | 54,901 | 59,171 | 11,381 | 81,764 | 43,062 | 21,275 |
| Cottonwood | 1,936 | -- | 1,936 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 112,159 | 10,249 | 29,728 | 20,131 | 8,352 | 22,015 | 8,622 | 13,062 |
| Quaking aspen | 638,290 | 37,596 | 193,279 | 88,153 | 66,865 | 126,220 | 66,655 | 59,522 |
| Basswood | 132,115 | 16,890 | 9,114 | 17,654 | 3,626 | 17,052 | 62,184 | 5,595 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 91,220 | 35,971 | 8,949 | 12,337 | 7,788 | 7,619 | 1,700 | 16,856 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 124,011 | 58,223 | 9,303 | 17,901 | 1,378 | 15,336 | 16,769 | 5,101 |
| Paper birch | 287,113 | 15,578 | 67,218 | 43,489 | 24,603 | 61,474 | 25,607 | 49,144 |
| Other hardwoods | 665 | 665 | -- | -- | -- | -- | -- | -- |
| Total | 5,154,582 | 1,240,079 | 919,677 | 560,357 | 727,339 | 684,949 | 467,386 | 554,795 |
| All species | 9,395,207 | 1,888,985 | 1,659,894 | 1,134,546 | 1,466,285 | 1,240,067 | 833,200 | 1,172,230 |

[1] International 1/4-inch rule.

Table 30.--Net volume of growing stock on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| | | Diameter class (inches at breast height) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All classes | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 146,073 | 5,087 | 7,327 | 10,367 | 14,744 | 23,789 | 19,655 | 12,402 | 17,402 | 13,892 | 16,046 | 5,362 | -- |
| Red pine | 138,860 | 21,595 | 35,973 | 19,685 | 18,467 | 12,071 | 17,216 | 7,887 | 3,316 | 1,558 | 1,092 | -- | -- |
| Jack pine | 174,266 | 46,995 | 64,590 | 38,329 | 13,511 | 6,066 | 1,835 | 2,847 | 93 | -- | -- | -- | -- |
| White spruce | 148,642 | 17,627 | 25,696 | 39,129 | 28,077 | 18,738 | 8,088 | 7,165 | 1,669 | 1,741 | 712 | -- | -- |
| Black spruce | 170,997 | 86,349 | 50,510 | 19,380 | 6,655 | 1,435 | 1,293 | 415 | 4,960 | -- | -- | -- | -- |
| Balsam fir | 259,257 | 110,655 | 77,734 | 39,660 | 20,168 | 7,885 | 2,129 | 1,026 | -- | -- | -- | -- | -- |
| Hemlock | 133,434 | 6,452 | 13,069 | 15,564 | 18,656 | 23,682 | 21,309 | 10,730 | 8,257 | 7,258 | 7,820 | 551 | 86 |
| Tamarack | 42,467 | 15,890 | 11,467 | 10,013 | 2,854 | 1,544 | 593 | 106 | -- | -- | -- | -- | -- |
| Northern white-cedar | 532,848 | 176,212 | 148,377 | 97,265 | 55,443 | 29,072 | 14,726 | 5,851 | 2,934 | 1,095 | 1,647 | 226 | -- |
| Other softwoods | 1,440 | 424 | 660 | 356 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,748,284 | 487,286 | 435,403 | 289,748 | 178,575 | 124,282 | 86,844 | 48,429 | 38,631 | 25,544 | 27,317 | 6,139 | 86 |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 358 | -- | -- | 239 | -- | 119 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 21,707 | 1,912 | 3,086 | 4,634 | 3,229 | 3,087 | 2,424 | 1,570 | 889 | 617 | 259 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 99,743 | 8,597 | 9,348 | 14,430 | 13,279 | 15,937 | 13,971 | 9,496 | 4,159 | 4,586 | 4,173 | 1,274 | 493 |
| Hard maple | 536,418 | 81,933 | 111,579 | 97,414 | 77,086 | 60,588 | 50,394 | 29,327 | 14,961 | 6,814 | 5,385 | 937 | -- |
| Soft maple | 477,453 | 92,835 | 112,246 | 92,770 | 68,022 | 53,038 | 25,902 | 18,531 | 8,891 | 2,694 | 2,336 | 188 | -- |
| Beech | 168,298 | 16,617 | 17,283 | 22,332 | 26,979 | 31,678 | 24,795 | 16,612 | 7,341 | 2,605 | 1,829 | 227 | -- |
| Ash | 66,641 | 23,443 | 14,817 | 12,347 | 8,246 | 4,647 | 1,353 | 936 | 852 | -- | -- | -- | -- |
| Balsam poplar | 89,733 | 9,052 | 13,277 | 16,697 | 16,065 | 14,576 | 10,049 | 4,925 | 3,647 | 1,445 | -- | -- | -- |
| Cottonwood | 368 | -- | -- | -- | -- | 238 | 130 | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 66,570 | 9,667 | 19,961 | 16,369 | 8,734 | 6,845 | 2,242 | 2,302 | 450 | -- | -- | -- | -- |
| Quaking aspen | 363,836 | 70,877 | 91,890 | 83,444 | 63,960 | 32,376 | 12,870 | 4,828 | 2,440 | 1,024 | 127 | -- | -- |
| Basswood | 50,367 | 6,404 | 8,337 | 11,523 | 11,663 | 5,772 | 2,942 | 2,154 | 927 | 390 | 255 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 49,645 | 8,185 | 13,344 | 9,298 | 12,367 | 4,407 | 1,441 | 311 | 201 | 91 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 41,158 | 5,240 | 6,643 | 6,825 | 6,293 | 7,128 | 3,894 | 3,124 | 1,099 | 532 | 239 | 141 | -- |
| Paper birch | 253,926 | 70,714 | 76,305 | 52,709 | 31,626 | 14,577 | 5,772 | 1,523 | 222 | 261 | 217 | -- | -- |
| Other hardwoods | 239 | -- | 103 | -- | -- | 136 | -- | -- | -- | -- | -- | -- | -- |
| Total | 2,286,460 | 405,476 | 498,219 | 441,031 | 347,549 | 255,149 | 158,179 | 95,639 | 46,079 | 21,059 | 14,820 | 2,767 | 493 |
| All species | 4,034,744 | 892,762 | 933,622 | 730,779 | 526,124 | 379,431 | 245,023 | 144,068 | 84,710 | 46,603 | 42,137 | 8,906 | 579 |

## Table 31.--Net volume of sawtimber on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 736,589 | 51,993 | 76,219 | 126,391 | 106,186 | 69,695 | 98,241 | 79,777 | 95,071 | 33,016 | -- |
| Red pine | 447,746 | 108,486 | 100,954 | 65,579 | 94,699 | 44,110 | 18,218 | 9,179 | 6,521 | -- | -- |
| Jack pine | 309,368 | 188,635 | 66,944 | 29,848 | 9,309 | 14,145 | 487 | -- | -- | -- | -- |
| White spruce | 527,783 | 192,792 | 138,935 | 94,844 | 41,621 | 36,977 | 9,113 | 9,521 | 3,980 | -- | -- |
| Black spruce | 169,698 | 88,071 | 33,224 | 7,693 | 7,299 | 2,459 | 30,952 | -- | -- | -- | -- |
| Balsam fir | 323,226 | 173,148 | 94,749 | 38,721 | 11,249 | 5,359 | -- | -- | -- | -- | -- |
| Hemlock | 661,391 | 88,478 | 106,868 | 136,176 | 123,441 | 63,695 | 48,533 | 43,326 | 47,014 | 3,349 | 511 |
| Tamarack | 66,942 | 42,336 | 13,472 | 7,749 | 2,881 | 504 | -- | -- | -- | -- | -- |
| Northern white-cedar | 996,280 | 457,960 | 264,815 | 141,436 | 72,726 | 29,341 | 14,408 | 5,557 | 8,797 | 1,240 | -- |
| Other softwoods | 1,602 | 1,602 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 4,240,625 | 1,393,501 | 896,180 | 648,437 | 469,411 | 266,285 | 219,952 | 147,360 | 161,383 | 37,605 | 511 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 637 | -- | -- | 637 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 65,731 | -- | 16,213 | 16,541 | 13,615 | 9,089 | 5,165 | 3,594 | 1,514 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 367,659 | -- | 71,362 | 87,888 | 78,543 | 53,389 | 23,056 | 25,189 | 20,816 | 5,655 | 1,761 |
| Hard maple | 1,366,336 | -- | 395,660 | 340,247 | 296,560 | 173,702 | 87,528 | 39,344 | 29,315 | 3,980 | -- |
| Soft maple | 947,043 | -- | 321,773 | 289,443 | 150,033 | 107,578 | 51,105 | 14,576 | 11,757 | 778 | -- |
| Beech | 653,154 | -- | 150,381 | 185,658 | 148,368 | 99,050 | 43,394 | 15,077 | 10,107 | 1,119 | -- |
| Ash | 88,096 | -- | 44,543 | 25,652 | 7,520 | 5,382 | 4,999 | -- | -- | -- | -- |
| Balsam poplar | 278,417 | -- | 89,844 | 80,653 | 54,714 | 26,594 | 19,106 | 7,506 | -- | -- | -- |
| Cottonwood | 1,936 | -- | -- | 1,256 | 680 | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 112,159 | -- | 46,675 | 37,594 | 12,593 | 12,827 | 2,470 | -- | -- | -- | -- |
| Quaking aspen | 638,290 | -- | 342,525 | 178,261 | 71,035 | 26,876 | 13,384 | 5,538 | 671 | -- | -- |
| Basswood | 132,115 | -- | 60,518 | 32,610 | 17,317 | 12,742 | 5,357 | 2,218 | 1,353 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 91,220 | -- | 61,971 | 20,211 | 6,347 | 1,342 | 925 | 424 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 124,011 | -- | 37,370 | 39,845 | 20,496 | 16,307 | 5,574 | 2,590 | 1,183 | 646 | -- |
| Paper birch | 287,113 | -- | 168,390 | 77,221 | 29,857 | 7,775 | 1,104 | 1,687 | 1,079 | -- | -- |
| Other hardwoods | 665 | -- | -- | 665 | -- | -- | -- | -- | -- | -- | -- |
| Total | 5,154,582 | -- | 1,807,225 | 1,414,382 | 907,678 | 552,653 | 263,167 | 117,743 | 77,795 | 12,178 | 1,761 |
| All species | 9,395,207 | 1,393,501 | 2,703,405 | 2,062,819 | 1,377,089 | 818,938 | 483,119 | 265,103 | 239,178 | 49,783 | 2,272 |

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[1] International 1/4-inch rule.

## Table 32.--Net volume of growing stock on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All types | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 146,073 | 5,190 | 6,978 | 47,948 | 9,410 | 2,713 | 11,558 | 20,113 |
| Red pine | 138,860 | 21,071 | 97,985 | 6,881 | 201 | 1,682 | 2,809 | 272 |
| Jack pine | 174,266 | 133,263 | 19,089 | 1,366 | -- | 548 | 12,756 | -- |
| White spruce | 148,642 | 348 | 1,256 | 2,316 | 55,842 | 17,403 | 1,103 | 15,883 |
| Black spruce | 170,997 | 6,202 | 1,130 | 3,121 | 8,382 | 727 | 99,164 | 35,907 |
| Balsam fir | 259,257 | 75 | 1,372 | 1,386 | 54,422 | 4,095 | 8,077 | 43,792 |
| Hemlock | 133,434 | -- | -- | 1,533 | 3,374 | 174 | 1,667 | 6,909 |
| Tamarack | 42,467 | 103 | 292 | 494 | 1,258 | 159 | 2,601 | 14,680 |
| Northern white-cedar | 532,848 | 136 | 226 | 1,176 | 23,537 | 6,179 | 7,165 | 393,045 |
| Other softwoods | 1,440 | -- | 307 | -- | 81 | -- | -- | -- |
| Total | 1,748,284 | 166,388 | 128,635 | 66,221 | 156,507 | 33,680 | 146,900 | 530,601 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 358 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 21,707 | 704 | -- | -- | -- | -- | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 99,743 | -- | -- | -- | 3,357 | 206 | 89 | 8,053 |
| Hard maple | 536,418 | -- | -- | 503 | 433 | 183 | 525 | 1,880 |
| Soft maple | 477,453 | 524 | 2,145 | 3,440 | 11,402 | 1,364 | 2,114 | 17,954 |
| Beech | 168,298 | -- | -- | 312 | 216 | 108 | -- | -- |
| Ash | 66,641 | -- | -- | -- | 1,117 | -- | -- | 8,999 |
| Balsam poplar | 89,733 | -- | -- | 390 | 5,299 | 1,086 | 340 | 9,806 |
| Cottonwood | 368 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 66,570 | 1,108 | 2,078 | 738 | 474 | -- | 1,896 | 882 |
| Quaking aspen | 363,836 | 1,404 | 888 | 3,268 | 20,893 | 3,603 | 16,375 | 11,631 |
| Basswood | 50,367 | -- | -- | -- | 125 | -- | -- | 329 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 49,645 | 105 | 748 | -- | 224 | -- | 72 | 69 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 41,158 | -- | -- | -- | 930 | 118 | -- | 955 |
| Paper birch | 253,926 | 515 | 1,005 | 4,344 | 15,347 | 1,503 | 6,117 | 48,873 |
| Other hardwoods | 239 | -- | -- | -- | -- | -- | -- | -- |
| Total | 2,286,460 | 4,360 | 6,864 | 12,995 | 59,817 | 8,171 | 27,528 | 109,431 |
| All species | 4,034,744 | 170,748 | 135,499 | 79,216 | 216,324 | 41,851 | 174,428 | 640,032 |

(Table 32 continued on next page)

(Table 32 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 331 | 410 | 3,071 | 28,887 | 7,968 | 1,386 | -- | 110 |
| Red pine | 223 | 342 | 83 | 1,013 | 5,083 | 741 | 262 | 212 |
| Jack pine | -- | 26 | -- | 741 | 6,176 | -- | -- | 301 |
| White spruce | -- | 320 | 4,282 | 17,985 | 26,300 | 5,572 | -- | 32 |
| Black spruce | 1,908 | -- | 3,534 | 4,471 | 5,784 | 550 | -- | 117 |
| Balsam fir | 625 | 85 | 15,243 | 54,892 | 66,182 | 8,817 | -- | 194 |
| Hemlock | -- | -- | 8,865 | 105,796 | 3,511 | 1,605 | -- | -- |
| Tamarack | 17,014 | -- | 2,820 | 127 | 2,555 | 129 | -- | 235 |
| Northern white-cedar | 3,057 | -- | 17,977 | 29,946 | 37,469 | 12,772 | -- | 163 |
| Other softwoods | -- | -- | -- | -- | -- | -- | 1,052 | -- |
| Total | 23,158 | 1,183 | 55,875 | 243,858 | 161,028 | 31,572 | 1,314 | 1,364 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 228 | -- | -- | -- | 130 | -- | -- |
| Select red oaks | -- | 12,074 | 371 | 5,682 | 2,153 | 723 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | 8,724 | 77,392 | 1,362 | 560 | -- | -- |
| Hard maple | -- | 115 | 2,758 | 516,576 | 9,792 | 3,653 | -- | -- |
| Soft maple | -- | 1,995 | 65,318 | 330,226 | 31,007 | 9,931 | -- | 33 |
| Beech | -- | -- | 543 | 166,892 | 227 | -- | -- | -- |
| Ash | -- | -- | 27,520 | 21,372 | 5,530 | 2,103 | -- | -- |
| Balsam poplar | 273 | -- | 3,481 | 5,410 | 60,817 | 2,649 | -- | 182 |
| Cottonwood | -- | -- | -- | 368 | -- | -- | -- | -- |
| Bigtooth aspen | -- | 798 | 774 | 13,425 | 42,236 | 2,127 | -- | 34 |
| Quaking aspen | 564 | 997 | 6,000 | 39,404 | 248,085 | 10,629 | -- | 95 |
| Basswood | -- | 377 | 441 | 47,170 | 1,925 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 77 | 561 | 46,094 | 1,695 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | -- | 5,581 | 27,376 | 6,123 | 75 | -- | -- |
| Paper birch | 448 | 746 | 9,955 | 37,060 | 67,729 | 60,188 | -- | 96 |
| Other hardwoods | -- | -- | -- | 136 | 103 | -- | -- | -- |
| Total | 1,285 | 17,407 | 132,027 | 1,334,583 | 478,784 | 92,768 | -- | 440 |
| All species | 24,443 | 18,590 | 187,902 | 1,578,441 | 639,812 | 124,340 | 1,314 | 1,804 |

Table 33.--Net volume of sawtimber on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 736,589 | 25,038 | 31,381 | 241,644 | 52,101 | 11,954 | 56,917 | 112,919 |
| Red pine | 447,746 | 71,538 | 292,196 | 32,559 | 622 | 7,345 | 12,792 | 1,534 |
| Jack pine | 309,368 | 224,063 | 33,609 | 1,386 | -- | 2,012 | 33,293 | -- |
| White spruce | 527,783 | 1,334 | -- | 8,150 | 219,108 | 62,179 | 3,258 | 54,516 |
| Black spruce | 169,698 | 959 | 3,427 | 3,029 | 20,904 | 593 | 78,132 | 41,349 |
| Balsam fir | 323,226 | -- | 2,538 | 1,865 | 48,856 | 8,902 | 18,272 | 37,082 |
| Hemlock | 661,391 | -- | -- | 7,534 | 16,343 | 1,049 | 8,161 | 38,913 |
| Tamarack | 66,942 | -- | 839 | 1,876 | 4,904 | -- | 1,154 | 22,598 |
| Northern white-cedar | 996,280 | -- | 395 | 1,677 | 56,800 | 13,632 | 12,413 | 691,532 |
| Other softwoods | 1,602 | -- | 690 | -- | -- | -- | -- | -- |
| Total | 4,240,625 | 322,932 | 365,075 | 299,720 | 419,638 | 107,666 | 224,392 | 1,000,443 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 637 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 65,731 | 600 | -- | -- | -- | -- | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 367,659 | -- | -- | -- | 13,893 | 674 | -- | 24,509 |
| Hard maple | 1,366,336 | -- | -- | 1,929 | -- | -- | 1,033 | 5,498 |
| Soft maple | 947,043 | -- | -- | 2,891 | 15,236 | -- | 2,771 | 24,232 |
| Beech | 653,154 | -- | -- | -- | -- | 634 | -- | -- |
| Ash | 88,096 | -- | -- | -- | 623 | -- | -- | 8,291 |
| Balsam poplar | 278,417 | -- | -- | 681 | 15,730 | 1,468 | 300 | 29,187 |
| Cottonwood | 1,936 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 112,159 | -- | 2,713 | 1,345 | 968 | -- | 1,252 | 2,912 |
| Quaking aspen | 638,290 | -- | 1,047 | 6,054 | 23,383 | 11,573 | 3,745 | 24,160 |
| Basswood | 132,115 | -- | -- | -- | 695 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 91,220 | -- | 608 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 124,011 | -- | -- | -- | 2,823 | 694 | -- | 2,429 |
| Paper birch | 287,113 | -- | -- | 4,744 | 15,404 | 531 | 5,927 | 59,496 |
| Other hardwoods | 665 | -- | -- | -- | -- | -- | -- | -- |
| Total | 5,154,582 | 600 | 4,368 | 17,644 | 88,755 | 15,574 | 15,028 | 180,714 |
| All species | 9,395,207 | 323,532 | 369,443 | 317,364 | 508,393 | 123,240 | 239,420 | 1,181,157 |

(Table 33 continued on next page)

[1] International 1/4-inch rule.

(Table 33 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 1,310 | 1,800 | 15,957 | 145,947 | 33,349 | 5,657 | -- | 615 |
| Red pine | 1,175 | 1,200 | -- | 5,112 | 16,069 | 3,987 | 1,464 | 153 |
| Jack pine | -- | 130 | -- | 2,857 | 11,414 | -- | -- | 604 |
| White spruce | -- | 807 | 15,722 | 64,130 | 83,088 | 15,333 | -- | 158 |
| Black spruce | 554 | -- | 8,217 | 10,040 | 1,977 | -- | -- | 517 |
| Balsam fir | -- | -- | 17,592 | 108,551 | 70,849 | 8,100 | -- | 619 |
| Hemlock | -- | -- | 44,285 | 526,258 | 12,007 | 6,841 | -- | -- |
| Tamarack | 20,920 | -- | 5,243 | 680 | 7,038 | 574 | -- | 1,116 |
| Northern white-cedar | 5,871 | -- | 48,249 | 82,230 | 62,513 | 20,567 | -- | 401 |
| Other softwoods | -- | -- | -- | -- | -- | -- | 912 | -- |
| Total | 29,830 | 3,937 | 155,265 | 945,805 | 298,304 | 61,059 | 2,376 | 4,183 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 637 | -- | -- | -- | -- | -- | -- |
| Select red oaks | -- | 33,931 | 727 | 23,131 | 5,589 | 1,753 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | 34,129 | 288,918 | 4,899 | 637 | -- | -- |
| Hard maple | -- | -- | 3,804 | 1,331,125 | 10,539 | 12,408 | -- | -- |
| Soft maple | -- | 1,021 | 162,774 | 710,793 | 22,958 | 4,367 | -- | -- |
| Beech | -- | -- | 1,349 | 651,171 | -- | -- | -- | -- |
| Ash | -- | -- | 36,045 | 38,841 | 4,296 | -- | -- | -- |
| Balsam poplar | -- | -- | 9,513 | 22,716 | 191,702 | 6,377 | -- | 743 |
| Cottonwood | -- | -- | -- | 1,936 | -- | -- | -- | -- |
| Bigtooth aspen | -- | 2,059 | 3,606 | 41,057 | 52,345 | 3,902 | -- | -- |
| Quaking aspen | -- | 665 | 14,528 | 111,458 | 416,283 | 25,394 | -- | -- |
| Basswood | -- | 2,103 | -- | 126,868 | 2,449 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | -- | 1,789 | 88,096 | 727 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | -- | 13,790 | 94,972 | 9,303 | -- | -- | -- |
| Paper birch | -- | -- | 16,008 | 65,720 | 55,491 | 63,792 | -- | -- |
| Other hardwoods | -- | -- | -- | 665 | -- | -- | -- | -- |
| Total | -- | 40,416 | 298,062 | 3,597,467 | 776,581 | 118,630 | -- | 743 |
| All species | 29,830 | 44,353 | 453,327 | 4,543,272 | 1,074,885 | 179,689 | 2,376 | 4,926 |

Table 34.--Net volume of growing stock on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 146,073 | 29,163 | -- | 420 | -- | 52,417 | 102 | 28,355 | 7,351 | 11,267 | 16,998 |
| Red pine | 138,860 | 79,966 | -- | 1,058 | -- | 39,821 | 607 | 2,447 | 4,439 | 3,362 | 7,160 |
| Jack pine | 174,266 | 87,123 | -- | 4,507 | -- | 68,851 | 214 | 2,717 | 3,307 | 2,497 | 5,050 |
| White spruce | 148,642 | 56,757 | -- | 732 | -- | 28,119 | 104 | 13,578 | 12,191 | 12,615 | 24,546 |
| Black spruce | 170,997 | 64,693 | -- | -- | 149 | 49,661 | -- | 21,908 | 6,955 | 10,507 | 17,124 |
| Balsam fir | 259,257 | 33,962 | -- | 954 | 101 | 62,690 | 162 | 46,151 | 36,656 | 17,606 | 60,975 |
| Hemlock | 133,434 | 26,955 | -- | 184 | -- | 25,819 | -- | 42,888 | 9,572 | 8,523 | 19,493 |
| Tamarack | 42,467 | 1,734 | -- | -- | 118 | 17,926 | 148 | 7,594 | 7,928 | 690 | 6,329 |
| Northern white-cedar | 532,848 | 47,514 | -- | 242 | 244 | 154,891 | 1,047 | 116,320 | 72,257 | 42,891 | 97,442 |
| Other softwoods | 1,440 | -- | -- | -- | -- | -- | -- | -- | 1,052 | 81 | 307 |
| Total | 1,748,284 | 427,867 | -- | 8,097 | 612 | 500,195 | 2,384 | 281,958 | 161,708 | 110,039 | 255,424 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 358 | -- | -- | -- | -- | 109 | -- | -- | -- | 130 | 119 |
| Select red oaks | 21,707 | 665 | -- | -- | -- | 4,521 | -- | 69 | 2,848 | 2,586 | 11,018 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 99,743 | 25,200 | -- | 1,241 | -- | 16,108 | 299 | 26,539 | 8,103 | 5,490 | 16,763 |
| Hard maple | 536,418 | 103,156 | -- | 379 | 2,588 | 68,908 | 513 | 125,779 | 94,286 | 23,961 | 116,848 |
| Soft maple | 477,453 | 112,998 | -- | 505 | 95 | 101,468 | 1,426 | 107,301 | 41,022 | 24,878 | 87,760 |
| Beech | 168,298 | 37,164 | -- | -- | -- | 15,488 | -- | 74,302 | 5,982 | 9,111 | 26,251 |
| Ash | 66,641 | 2,515 | -- | 95 | 259 | 12,415 | -- | 10,413 | 14,207 | 3,187 | 23,550 |
| Balsam poplar | 89,733 | 3,094 | -- | -- | 237 | 14,658 | -- | 14,197 | 21,059 | 5,652 | 30,836 |
| Cottonwood | 368 | -- | -- | -- | -- | 368 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 66,570 | 21,796 | -- | -- | 119 | 16,680 | -- | 3,176 | 6,384 | 7,421 | 10,994 |
| Quaking aspen | 363,836 | 76,666 | -- | 302 | 443 | 79,927 | -- | 30,544 | 63,975 | 22,001 | 89,978 |
| Basswood | 50,367 | 5,291 | -- | -- | 349 | 6,911 | -- | 6,528 | 9,850 | 2,708 | 18,730 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 49,645 | 22,200 | -- | -- | 85 | 7,507 | 409 | 7,939 | 2,431 | 1,571 | 7,503 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 41,158 | 12,076 | -- | -- | 626 | 8,658 | -- | 3,364 | 11,058 | 574 | 4,802 |
| Paper birch | 253,926 | 44,787 | -- | 1,521 | 526 | 81,030 | -- | 24,949 | 32,705 | 17,265 | 51,143 |
| Other hardwoods | 239 | -- | -- | -- | -- | -- | -- | 136 | -- | -- | 103 |
| Total | 2,286,460 | 467,608 | -- | 4,043 | 5,327 | 434,756 | 2,647 | 435,236 | 313,910 | 126,535 | 496,398 |
| All species | 4,034,744 | 895,475 | -- | 12,140 | 5,939 | 934,951 | 5,031 | 717,194 | 475,618 | 236,574 | 751,822 |

Table 35.--Net volume of sawtimber on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 736,589 | 158,724 | -- | -- | -- | 247,885 | 499 | 153,526 | 37,366 | 56,413 | 82,176 |
| Red pine | 447,746 | 199,420 | -- | 5,931 | -- | 167,035 | -- | 9,126 | 16,475 | 16,165 | 33,594 |
| Jack pine | 309,368 | 133,077 | -- | 11,250 | -- | 136,092 | -- | 4,697 | 7,943 | 7,933 | 8,376 |
| White spruce | 527,783 | 214,462 | -- | 2,881 | -- | 100,532 | -- | 44,159 | 40,752 | 46,357 | 78,640 |
| Black spruce | 169,698 | 68,791 | -- | -- | -- | 47,670 | -- | 21,411 | 7,193 | 10,383 | 14,250 |
| Balsam fir | 323,226 | 39,990 | -- | 2,749 | 428 | 86,224 | -- | 56,684 | 36,694 | 22,935 | 77,522 |
| Hemlock | 661,391 | 144,781 | -- | 1,062 | -- | 124,331 | -- | 215,966 | 41,082 | 44,382 | 89,787 |
| Tamarack | 66,942 | 4,159 | -- | -- | -- | 30,410 | -- | 11,617 | 13,207 | 1,401 | 6,148 |
| Northern white-cedar | 996,280 | 57,460 | -- | 409 | 409 | 314,945 | 392 | 237,619 | 118,170 | 89,310 | 177,566 |
| Other softwoods | 1,602 | -- | -- | -- | -- | -- | -- | -- | 912 | -- | 690 |
| Total | 4,240,625 | 1,020,864 | -- | 24,282 | 837 | 1,255,124 | 891 | 754,805 | 319,794 | 295,279 | 568,749 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 637 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 637 |
| Select red oaks | 65,731 | -- | -- | -- | -- | 15,098 | -- | -- | 11,997 | 5,747 | 32,889 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 367,659 | 94,953 | -- | 3,996 | -- | 59,872 | 1,389 | 109,457 | 21,784 | 17,161 | 59,047 |
| Hard maple | 1,366,336 | 209,764 | -- | 1,527 | 2,880 | 169,150 | -- | 458,510 | 218,895 | 62,426 | 243,184 |
| Soft maple | 947,043 | 170,640 | -- | -- | -- | 188,002 | 4,302 | 267,517 | 66,779 | 42,235 | 207,568 |
| Beech | 653,154 | 137,283 | -- | -- | -- | 58,330 | -- | 307,739 | 24,640 | 34,175 | 90,987 |
| Ash | 88,096 | -- | -- | -- | -- | 11,305 | -- | 19,640 | 15,956 | 4,473 | 36,722 |
| Balsam poplar | 278,417 | 14,542 | -- | -- | 1,295 | 38,033 | -- | 46,831 | 64,594 | 17,161 | 95,961 |
| Cottonwood | 1,936 | -- | -- | -- | -- | 1,936 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 112,159 | 30,136 | -- | -- | 644 | 26,121 | -- | 3,354 | 13,710 | 5,853 | 32,341 |
| Quaking aspen | 638,290 | 111,531 | -- | -- | 648 | 149,228 | -- | 42,841 | 119,314 | 46,794 | 167,934 |
| Basswood | 132,115 | 10,280 | -- | -- | 1,920 | 17,107 | -- | 19,156 | 25,516 | 9,704 | 48,432 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 91,220 | 48,383 | -- | -- | -- | 7,494 | 587 | 13,919 | 7,423 | 4,132 | 9,282 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 124,011 | 38,731 | -- | -- | 2,383 | 25,506 | -- | 8,931 | 33,306 | 1,392 | 13,762 |
| Paper birch | 287,113 | 36,466 | -- | 1,175 | -- | 91,547 | -- | 24,586 | 42,925 | 14,197 | 76,217 |
| Other hardwoods | 665 | -- | -- | -- | -- | -- | -- | 665 | -- | -- | -- |
| Total | 5,154,582 | 902,709 | -- | 6,698 | 9,770 | 858,729 | 6,278 | 1,323,146 | 666,839 | 265,450 | 1,114,963 |
| All species | 9,395,207 | 1,923,573 | -- | 30,980 | 10,607 | 2,113,853 | 7,169 | 2,077,951 | 986,633 | 560,729 | 1,683,712 |

[1] International 1/4-inch rule.

Table 36.--Net volume of growing stock on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 170,748 | 5,582 | 3,684 | 8,477 | 39,153 | 64,671 | 23,821 | 15,383 | 6,152 | 3,825 | -- | -- | -- | -- |
| Red pine | 135,499 | 1,421 | 4,669 | 33,793 | 49,207 | 15,350 | 4,031 | 5,131 | 10,246 | 1,010 | 2,366 | 8,275 | -- | -- |
| White pine | 79,216 | 823 | 1,447 | 2,769 | 1,961 | 4,769 | 6,604 | 19,509 | 10,142 | 3,568 | 3,380 | 9,818 | 7,202 | 7,224 |
| Balsam fir | 216,324 | 11,288 | 10,554 | 3,790 | 34,559 | 87,039 | 33,358 | 12,021 | 6,784 | 2,110 | 4,062 | 8,217 | 2,542 | -- |
| White spruce | 41,851 | 221 | 1,806 | 550 | -- | 11,456 | 5,935 | 5,532 | 5,357 | 7,516 | -- | 3,478 | -- | -- |
| Black spruce | 174,428 | 10,814 | 11,953 | 39,113 | 49,565 | 18,162 | 17,278 | 9,671 | 8,087 | 3,067 | 4,281 | 1,107 | -- | 1,330 |
| Northern white-cedar | 640,032 | 3,550 | 13,251 | 25,312 | 33,021 | 31,507 | 61,366 | 81,162 | 70,325 | 71,886 | 64,135 | 83,812 | 54,712 | 45,993 |
| Tamarack | 24,443 | 362 | 2,240 | 1,747 | 903 | 1,133 | 5,000 | 5,172 | 3,433 | 1,686 | 1,746 | 1,021 | -- | -- |
| Oak-hickory | 18,590 | -- | 998 | -- | 384 | 3,193 | 7,145 | 2,054 | -- | 938 | 2,083 | -- | 1,795 | -- |
| Elm-ash-soft maple | 187,902 | 6,940 | 8,233 | 7,645 | 6,927 | 20,343 | 36,036 | 14,622 | 11,656 | 12,939 | 18,807 | 30,276 | 10,045 | 3,433 |
| Maple-birch | 1,578,441 | 30,029 | 34,359 | 39,980 | 89,973 | 264,905 | 199,010 | 178,574 | 105,886 | 138,692 | 142,181 | 198,421 | 111,011 | 45,420 |
| Aspen | 639,812 | 42,361 | 23,316 | 10,850 | 140,317 | 154,188 | 117,501 | 70,704 | 20,173 | 16,019 | 31,558 | 12,825 | -- | -- |
| Paper birch | 124,340 | 7,162 | 3,850 | 826 | 3,462 | 19,377 | 37,662 | 34,192 | 8,378 | -- | 4,076 | 5,355 | -- | -- |
| Exotic | 1,314 | -- | -- | 1,314 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 1,804 | 403 | 195 | -- | 179 | 352 | 474 | -- | -- | 201 | -- | -- | -- | -- |
| All types | 4,034,744 | 120,956 | 120,555 | 176,166 | 449,611 | 696,445 | 555,221 | 453,727 | 266,619 | 263,457 | 278,675 | 362,605 | 187,307 | 103,400 |

Table 37.--Net volume of sawtimber on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Forest type | All classes | Stand-age lass (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 323,532 | 10,790 | 11,482 | 9,016 | 73,360 | 92,596 | 45,212 | 44,892 | 22,413 | 13,771 | -- | -- | -- | -- |
| Red pine | 369,443 | 896 | 11,813 | 46,423 | 128,033 | 48,709 | 18,787 | 20,105 | 48,945 | 5,389 | 10,695 | 29,648 | -- | -- |
| White pine | 317,364 | 2,493 | 7,278 | 6,652 | 5,986 | 11,154 | 20,462 | 88,869 | 37,387 | 17,699 | 16,426 | 41,741 | 27,665 | 33,552 |
| Balsam fir | 508,393 | 28,452 | 23,127 | 2,531 | 50,656 | 258,310 | 58,894 | 15,560 | 16,351 | 8,809 | 11,830 | 24,660 | 9,213 | -- |
| White spruce | 123,240 | 650 | 6,264 | -- | -- | 29,982 | 12,293 | 19,851 | 12,325 | 26,079 | -- | 15,796 | -- | -- |
| Black spruce | 239,420 | 13,377 | 20,493 | 86,957 | 34,914 | 18,883 | 25,456 | 11,022 | 10,319 | -- | 12,620 | -- | -- | 5,379 |
| Northern white-cedar | 1,181,157 | 8,281 | 18,275 | 19,849 | 34,596 | 45,355 | 79,506 | 99,889 | 95,869 | 131,914 | 138,287 | 202,698 | 156,136 | 150,502 |
| Tamarack | 29,830 | 1,175 | 1,468 | 2,392 | 1,014 | 496 | 4,908 | 5,241 | 6,163 | 962 | 3,682 | 2,329 | -- | -- |
| Oak-hickory | 44,353 | -- | 691 | -- | 130 | 3,641 | 15,230 | 9,717 | -- | 973 | 6,718 | -- | 7,253 | -- |
| Elm-ash-soft maple | 453,327 | 9,371 | 11,748 | 10,038 | 6,529 | 30,120 | 74,390 | 23,953 | 32,347 | 46,995 | 58,102 | 104,392 | 32,157 | 13,185 |
| Maple-birch | 4,543,272 | 86,250 | 87,673 | 87,967 | 177,206 | 513,915 | 423,362 | 480,615 | 308,735 | 488,380 | 514,434 | 718,446 | 488,711 | 167,578 |
| Aspen | 1,074,885 | 57,295 | 30,385 | 13,992 | 184,481 | 215,280 | 177,094 | 139,638 | 58,383 | 53,346 | 101,935 | 43,056 | -- | -- |
| Paper birch | 179,689 | 11,475 | 8,061 | -- | 1,636 | 28,611 | 47,481 | 37,246 | 16,110 | -- | 12,267 | 16,802 | -- | -- |
| Exotic | 2,376 | -- | -- | 2,376 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 4,926 | 379 | 568 | -- | -- | 1,633 | 1,763 | -- | -- | 583 | -- | -- | -- | -- |
| All types | 9,395,207 | 230,884 | 239,326 | 288,193 | 698,541 | 1,298,685 | 1,004,838 | 996,598 | 665,347 | 794,900 | 886,996 | 1,199,568 | 721,135 | 370,196 |

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[1] International 1/4-inch rule.

Table 38.--Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Jack pine | | | | | | | | |
| Sawtimber | 36,972 | -- | -- | -- | 611 | 5,674 | 3,399 | 6,650 |
| Poletimber | 130,267 | -- | 188 | 3,885 | 5,389 | 8,154 | 7,201 | 5,556 |
| Sapling & seedling | 3,509 | 271 | 1,124 | 261 | 1,633 | -- | -- | -- |
| All stands | 170,748 | 271 | 1,312 | 4,146 | 7,633 | 13,828 | 10,600 | 12,206 |
| Red pine | | | | | | | | |
| Sawtimber | 55,884 | -- | 619 | -- | 1,010 | 731 | 1,378 | 2,013 |
| Poletimber | 76,698 | -- | -- | -- | -- | 1,629 | 1,205 | 1,548 |
| Sapling & seedling | 2,917 | -- | 234 | 1,173 | 1,142 | -- | 368 | -- |
| All stands | 135,499 | -- | 853 | 1,173 | 2,152 | 2,360 | 2,951 | 3,561 |
| White pine | | | | | | | | |
| Sawtimber | 62,126 | -- | -- | 583 | 789 | 675 | 2,414 | 659 |
| Poletimber | 13,983 | -- | -- | -- | -- | 2,990 | 964 | 1,101 |
| Sapling & seedling | 3,107 | 283 | 765 | -- | 846 | -- | -- | 1,213 |
| All stands | 79,216 | 283 | 765 | 583 | 1,635 | 3,665 | 3,378 | 2,973 |
| Balsam fir | | | | | | | | |
| Sawtimber | 77,149 | -- | -- | -- | -- | -- | 840 | -- |
| Poletimber | 112,620 | -- | -- | -- | 601 | 2,544 | -- | 2,115 |
| Sapling & seedling | 26,555 | 52 | 222 | 2,229 | 3,640 | 4,534 | 3,163 | 4,731 |
| All stands | 216,324 | 52 | 222 | 2,229 | 4,241 | 7,078 | 4,003 | 6,846 |
| White spruce | | | | | | | | |
| Sawtimber | 21,862 | -- | -- | -- | 589 | -- | -- | -- |
| Poletimber | 17,413 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 2,576 | -- | 643 | -- | 411 | -- | -- | 1,522 |
| All stands | 41,851 | -- | 643 | -- | 1,000 | -- | -- | 1,522 |
| Black spruce | | | | | | | | |
| Sawtimber | 6,307 | -- | -- | -- | -- | -- | 1,330 | -- |
| Poletimber | 131,753 | 174 | -- | -- | 27,014 | 2,599 | 3,667 | 5,618 |
| Sapling & seedling | 36,368 | 220 | 5,641 | 495 | 2,586 | 4,839 | 3,957 | 5,758 |
| All stands | 174,428 | 394 | 5,641 | 495 | 29,600 | 7,438 | 8,954 | 11,376 |
| Northern white-cedar | | | | | | | | |
| Sawtimber | 202,542 | -- | -- | -- | 2,403 | 715 | 2,132 | 2,287 |
| Poletimber | 376,681 | -- | -- | -- | 935 | 944 | 478 | 2,320 |
| Sapling & seedling | 60,809 | -- | 137 | 594 | 1,345 | 2,535 | 2,266 | 5,323 |
| All stands | 640,032 | -- | 137 | 594 | 4,683 | 4,194 | 4,876 | 9,930 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | 5,873 | 2,433 | 2,727 | 9,605 | -- | -- | -- |
| Poletimber | 12,536 | 7,370 | 31,325 | 34,017 | 14,646 | -- | -- |
| Sapling & seedling | 220 | -- | -- | -- | -- | -- | -- |
| All stands | 18,629 | 9,803 | 34,052 | 43,622 | 14,646 | -- | -- |
| Red pine | | | | | | | |
| Sawtimber | 8,347 | -- | 8,753 | 10,228 | 16,827 | 1,763 | 4,215 |
| Poletimber | 16,833 | -- | -- | 26,880 | 2,659 | 13,271 | 12,673 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 25,180 | -- | 8,753 | 37,108 | 19,486 | 15,034 | 16,888 |
| White pine | | | | | | | |
| Sawtimber | 13,400 | 1,516 | 9,155 | 25,395 | 2,917 | 4,623 | -- |
| Poletimber | -- | -- | -- | 8,928 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 13,400 | 1,516 | 9,155 | 34,323 | 2,917 | 4,623 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | 3,297 | 4,856 | 55,453 | 6,531 | -- | 6,172 |
| Poletimber | 16,500 | 8,567 | 20,908 | 19,694 | 18,962 | 9,833 | 12,896 |
| Sapling & seedling | 2,673 | 2,628 | 1,293 | 469 | 921 | -- | -- |
| All stands | 19,173 | 14,492 | 27,057 | 75,616 | 26,414 | 9,833 | 19,068 |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | -- | 1,968 | 4,059 | 6,256 | 8,990 |
| Poletimber | -- | -- | 5,077 | 1,902 | 7,275 | -- | 3,159 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | 5,077 | 3,870 | 11,334 | 6,256 | 12,149 |
| Black spruce | | | | | | | |
| Sawtimber | 1,830 | 1,529 | -- | 1,618 | -- | -- | -- |
| Poletimber | 6,734 | 3,542 | 14,360 | 56,310 | 9,280 | 2,455 | -- |
| Sapling & seedling | 3,050 | 2,398 | 3,402 | 3,023 | 999 | -- | -- |
| All stands | 11,614 | 7,469 | 17,762 | 60,951 | 10,279 | 2,455 | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | 5,632 | -- | 2,991 | 40,994 | 36,507 | 51,666 | 57,215 |
| Poletimber | 4,177 | 7,783 | 14,903 | 39,851 | 92,363 | 92,865 | 120,062 |
| Sapling & seedling | 5,532 | 2,529 | 3,079 | 10,149 | 14,730 | 11,613 | 977 |
| All stands | 15,341 | 10,312 | 20,973 | 90,994 | 143,600 | 156,144 | 178,254 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | 1,021 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 17,247 | -- | -- | -- | 824 | 2,559 | 1,612 | 4,565 |
| Sapling & seedling | 6,175 | 87 | 72 | 290 | 1,018 | 218 | 1,232 | -- |
| All stands | 24,443 | 87 | 72 | 290 | 1,842 | 2,777 | 2,844 | 4,565 |
| Oak-hickory | | | | | | | | |
| Sawtimber | 5,933 | -- | -- | -- | 924 | -- | -- | 1,130 |
| Poletimber | 11,659 | -- | -- | -- | -- | -- | 938 | 4,349 |
| Sapling & seedling | 998 | -- | -- | -- | -- | -- | -- | 998 |
| All stands | 18,590 | -- | -- | -- | 924 | -- | 938 | 6,477 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 82,811 | -- | -- | -- | -- | 2,183 | 976 | 1,019 |
| Poletimber | 80,888 | -- | -- | -- | 885 | 2,501 | 2,025 | 5,515 |
| Sapling & seedling | 24,203 | 121 | 475 | 1,232 | 1,197 | 1,555 | 3,318 | 5,138 |
| All stands | 187,902 | 121 | 475 | 1,232 | 2,082 | 6,239 | 6,319 | 11,672 |
| Maple-birch | | | | | | | | |
| Sawtimber | 817,471 | -- | 397 | -- | 2,737 | 1,925 | 1,397 | 21,224 |
| Poletimber | 683,648 | -- | 356 | 618 | 3,664 | 4,676 | 3,752 | 14,389 |
| Sapling & seedling | 77,322 | 171 | 78 | 879 | 3,893 | 12,297 | 6,664 | 17,226 |
| All stands | 1,578,441 | 171 | 831 | 1,497 | 10,294 | 18,898 | 11,813 | 52,839 |
| Aspen | | | | | | | | |
| Sawtimber | 126,853 | -- | -- | 692 | 986 | 13,978 | 1,108 | 5,793 |
| Poletimber | 447,962 | -- | 1,094 | 756 | 3,374 | 5,904 | 7,724 | 20,845 |
| Sapling & seedling | 64,997 | 732 | 4,185 | 11,600 | 8,094 | 14,065 | 9,255 | 2,634 |
| All stands | 639,812 | 732 | 5,279 | 13,048 | 12,454 | 33,947 | 18,087 | 29,272 |
| Paper birch | | | | | | | | |
| Sawtimber | 15,636 | -- | -- | -- | -- | -- | -- | 3,305 |
| Poletimber | 101,184 | -- | -- | -- | -- | 4,217 | 4,886 | 3,948 |
| Sapling & seedling | 7,520 | 129 | -- | 444 | 856 | 2,479 | -- | 1,328 |
| All stands | 124,340 | 129 | -- | 444 | 856 | 6,696 | 4,886 | 8,581 |
| Exotic | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,314 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,314 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 1,804 | 437 | 1,222 | 34 | 27 | -- | -- | -- |
| All types | | | | | | | | |
| Sawtimber | 1,512,567 | -- | 1,016 | 1,275 | 10,049 | 25,881 | 14,974 | 44,080 |
| Poletimber | 2,203,317 | 174 | 1,638 | 5,259 | 42,686 | 38,717 | 34,452 | 71,869 |
| Sapling & seedling | 317,056 | 2,066 | 13,576 | 19,197 | 26,661 | 42,522 | 30,223 | 45,871 |
| Nonstocked | 1,804 | 437 | 1,222 | 34 | 27 | -- | -- | -- |
| All stands | 4,034,744 | 2,677 | 17,452 | 25,765 | 79,423 | 107,120 | 79,649 | 161,820 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | |
| Sawtimber | 1,021 | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,338 | 3,291 | 3,058 | -- | -- | -- | -- |
| Sapling & seedling | 1,029 | 855 | 384 | -- | 990 | -- | -- |
| All stands | 3,388 | 4,146 | 3,442 | -- | 990 | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 1,796 | -- | -- | 2,083 | -- | -- | -- |
| Poletimber | 1,833 | 1,879 | 777 | 1,883 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 3,629 | 1,879 | 777 | 3,966 | -- | -- | -- |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 10,918 | -- | 790 | 13,500 | 26,382 | 22,869 | 4,174 |
| Poletimber | 3,545 | 1,396 | 15,956 | 7,426 | 31,505 | 10,134 | -- |
| Sapling & seedling | 2,085 | 1,680 | 3,640 | 1,477 | 2,285 | -- | -- |
| All stands | 16,548 | 3,076 | 20,386 | 22,403 | 60,172 | 33,003 | 4,174 |
| Maple-birch | | | | | | | |
| Sawtimber | 61,181 | 56,431 | 102,504 | 199,409 | 215,903 | 94,211 | 60,152 |
| Poletimber | 33,029 | 49,313 | 95,352 | 145,598 | 239,383 | 86,548 | 6,970 |
| Sapling & seedling | 13,809 | 11,367 | 3,066 | 6,893 | 979 | -- | -- |
| All stands | 108,019 | 117,111 | 200,922 | 351,900 | 456,265 | 180,759 | 67,122 |
| Aspen | | | | | | | |
| Sawtimber | 8,921 | 6,610 | 12,131 | 4,188 | 37,914 | 16,063 | 18,469 |
| Poletimber | 17,996 | 50,261 | 68,769 | 55,965 | 82,200 | 107,147 | 25,927 |
| Sapling & seedling | 6,612 | 2,893 | 2,393 | 1,430 | 1,104 | -- | -- |
| All stands | 33,529 | 59,764 | 83,293 | 61,583 | 121,218 | 123,210 | 44,396 |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | -- | 2,234 | 10,097 | -- | -- |
| Poletimber | 6,102 | -- | 32,108 | 19,672 | 15,501 | 6,449 | 8,301 |
| Sapling & seedling | 629 | 1,116 | 539 | -- | -- | -- | -- |
| All stands | 6,731 | 1,116 | 32,647 | 21,906 | 25,598 | 6,449 | 8,301 |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | 1,314 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | 1,314 | -- | -- | -- |
| Nonstocked | 84 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 118,919 | 71,816 | 143,907 | 366,675 | 357,137 | 197,451 | 159,387 |
| Poletimber | 120,623 | 133,402 | 302,593 | 419,440 | 513,774 | 328,702 | 189,988 |
| Sapling & seedling | 35,639 | 25,466 | 17,796 | 23,441 | 22,008 | 11,613 | 977 |
| Nonstocked | 84 | -- | -- | -- | -- | -- | -- |
| All stands | 275,265 | 230,684 | 464,296 | 809,556 | 892,919 | 537,766 | 350,352 |

## Table 39.--Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)1/

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Jack pine | | | | | | | | |
| Sawtimber | 127,742 | -- | -- | -- | 1,583 | 19,657 | 13,192 | 21,963 |
| Poletimber | 183,203 | -- | -- | 9,000 | 10,627 | 11,601 | 14,229 | 10,111 |
| Sapling & seedling | 12,587 | 813 | 4,390 | 458 | 5,877 | -- | -- | -- |
| All stands | 323,532 | 813 | 4,390 | 9,458 | 18,087 | 31,258 | 27,421 | 32,074 |
| Red pine | | | | | | | | |
| Sawtimber | 240,588 | -- | 3,362 | -- | 5,389 | 2,572 | 6,944 | 9,768 |
| Poletimber | 123,908 | -- | -- | -- | -- | 2,403 | 2,251 | 2,123 |
| Sapling & seedling | 4,947 | -- | -- | 4,257 | -- | -- | 690 | -- |
| All stands | 369,443 | -- | 3,362 | 4,257 | 5,389 | 4,975 | 9,885 | 11,891 |
| White pine | | | | | | | | |
| Sawtimber | 270,749 | -- | -- | 2,609 | 2,398 | 2,704 | 9,674 | 2,580 |
| Poletimber | 34,359 | -- | -- | -- | -- | 8,808 | 2,081 | 2,475 |
| Sapling & seedling | 12,256 | 1,545 | 4,020 | -- | 4,205 | -- | -- | 2,486 |
| All stands | 317,364 | 1,545 | 4,020 | 2,609 | 6,603 | 11,512 | 11,755 | 7,541 |
| Balsam fir | | | | | | | | |
| Sawtimber | 275,169 | -- | -- | -- | -- | -- | 2,493 | -- |
| Poletimber | 179,115 | -- | -- | -- | 1,418 | 2,434 | -- | 962 |
| Sapling & seedling | 54,109 | -- | 695 | 7,797 | 7,507 | 11,882 | 6,850 | 8,696 |
| All stands | 508,393 | -- | 695 | 7,797 | 8,925 | 14,316 | 9,343 | 9,658 |
| White spruce | | | | | | | | |
| Sawtimber | 77,712 | -- | -- | -- | 2,163 | -- | -- | -- |
| Poletimber | 38,614 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 6,914 | -- | 1,278 | -- | 1,466 | -- | -- | 4,170 |
| All stands | 123,240 | -- | 1,278 | -- | 3,629 | -- | -- | 4,170 |
| Black spruce | | | | | | | | |
| Sawtimber | 21,624 | -- | -- | -- | -- | -- | 5,380 | -- |
| Poletimber | 168,689 | -- | -- | -- | 71,955 | 3,143 | 3,622 | 3,373 |
| Sapling & seedling | 49,107 | 1,255 | 7,552 | -- | 3,563 | 5,751 | 3,413 | 9,134 |
| All stands | 239,420 | 1,255 | 7,552 | -- | 75,518 | 8,894 | 12,415 | 12,507 |
| Northern white-cedar | | | | | | | | |
| Sawtimber | 661,791 | -- | -- | -- | 10,196 | 1,876 | 9,451 | 7,170 |
| Poletimber | 455,364 | -- | -- | -- | 1,856 | 1,357 | -- | 2,875 |
| Sapling & seedling | 64,002 | -- | -- | 1,525 | 1,850 | 4,121 | 3,557 | 7,125 |
| All stands | 1,181,157 | -- | -- | 1,525 | 13,902 | 7,354 | 13,008 | 17,170 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | 20,406 | 9,432 | 9,709 | 31,800 | -- | -- | -- |
| Poletimber | 23,957 | 11,651 | 56,364 | 14,070 | 21,593 | -- | -- |
| Sapling & seedling | 1,049 | -- | -- | -- | -- | -- | -- |
| All stands | 45,412 | 21,083 | 66,073 | 45,870 | 21,593 | -- | -- |
| Red pine | | | | | | | |
| Sawtimber | 43,133 | -- | 39,208 | 46,708 | 63,982 | 4,429 | 15,093 |
| Poletimber | 35,986 | -- | -- | 37,494 | 2,548 | 37,584 | 3,519 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 79,119 | -- | 39,208 | 84,202 | 66,530 | 42,013 | 18,612 |
| White pine | | | | | | | |
| Sawtimber | 56,431 | 7,991 | 36,033 | 119,166 | 9,642 | 21,521 | -- |
| Poletimber | -- | -- | -- | 20,995 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 56,431 | 7,991 | 36,033 | 140,161 | 9,642 | 21,521 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | 11,246 | 14,733 | 205,909 | 20,149 | -- | 20,639 |
| Poletimber | 24,637 | 13,508 | 30,751 | 34,394 | 28,674 | 21,031 | 21,306 |
| Sapling & seedling | 3,574 | 5,989 | 402 | 717 | -- | -- | -- |
| All stands | 28,211 | 30,743 | 45,886 | 241,020 | 48,823 | 21,031 | 41,945 |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | -- | 5,711 | 17,892 | 23,909 | 28,037 |
| Poletimber | -- | -- | 11,374 | 4,399 | 16,653 | -- | 6,188 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | 11,374 | 10,110 | 34,545 | 23,909 | 34,225 |
| Black spruce | | | | | | | |
| Sawtimber | 6,303 | 4,931 | -- | 5,010 | -- | -- | -- |
| Poletimber | 12,456 | 555 | 19,997 | 39,957 | 8,580 | 5,051 | -- |
| Sapling & seedling | 2,898 | 5,828 | 5,663 | 1,819 | 2,231 | -- | -- |
| All stands | 21,657 | 11,314 | 25,660 | 46,786 | 10,811 | 5,051 | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | 19,738 | -- | 11,103 | 134,383 | 119,560 | 154,242 | 194,072 |
| Poletimber | 5,586 | 9,297 | 20,388 | 55,113 | 121,722 | 118,753 | 118,417 |
| Sapling & seedling | 4,337 | 4,589 | 1,349 | 16,447 | 10,380 | 7,437 | 1,285 |
| All stands | 29,661 | 13,886 | 32,840 | 205,943 | 251,662 | 280,432 | 313,774 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | 2,330 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 21,452 | -- | -- | -- | 603 | 2,366 | 2,989 | 5,140 |
| Sapling & seedling | 6,048 | -- | -- | 1,175 | 1,014 | -- | 2,549 | -- |
| All stands | 29,830 | -- | -- | 1,175 | 1,617 | 2,366 | 5,538 | 5,140 |
| Oak-hickory | | | | | | | | |
| Sawtimber | 23,688 | -- | -- | -- | 5,113 | -- | -- | 4,604 |
| Poletimber | 19,974 | -- | -- | -- | -- | -- | 973 | 7,035 |
| Sapling & seedling | 691 | -- | -- | -- | -- | -- | -- | 691 |
| All stands | 44,353 | -- | -- | -- | 5,113 | -- | 973 | 12,330 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 280,107 | -- | -- | -- | -- | 8,110 | 3,757 | 3,102 |
| Poletimber | 142,063 | -- | -- | -- | 435 | 5,063 | 4,974 | 7,871 |
| Sapling & seedling | 31,157 | -- | 1,567 | 2,688 | 1,496 | 1,222 | 3,624 | 5,745 |
| All stands | 453,327 | -- | 1,567 | 2,688 | 1,931 | 14,395 | 12,355 | 16,718 |
| Maple-birch | | | | | | | | |
| Sawtimber | 3,033,029 | -- | 1,128 | -- | 12,364 | 7,895 | 5,948 | 80,371 |
| Poletimber | 1,303,501 | -- | 555 | 373 | 3,461 | 7,725 | 6,881 | 24,678 |
| Sapling & seedling | 206,742 | 476 | -- | 706 | 8,637 | 36,668 | 16,056 | 44,934 |
| All stands | 4,543,272 | 476 | 1,683 | 1,079 | 24,462 | 52,288 | 28,885 | 149,983 |
| Aspen | | | | | | | | |
| Sawtimber | 435,807 | -- | -- | 1,849 | 4,893 | 63,717 | 3,643 | 19,303 |
| Poletimber | 551,552 | -- | 698 | 468 | 2,803 | 6,664 | 4,135 | 30,620 |
| Sapling & seedling | 87,526 | 1,923 | 8,363 | 8,856 | 10,727 | 24,436 | 10,685 | 6,428 |
| All stands | 1,074,885 | 1,923 | 9,061 | 11,173 | 18,423 | 94,817 | 18,463 | 56,351 |
| Paper birch | | | | | | | | |
| Sawtimber | 43,323 | -- | -- | -- | -- | -- | -- | 9,276 |
| Poletimber | 124,011 | -- | -- | -- | -- | 6,933 | 7,182 | 3,774 |
| Sapling & seedling | 12,355 | 574 | -- | 1,165 | -- | 6,405 | -- | 2,425 |
| All stands | 179,689 | 574 | -- | 1,165 | -- | 13,338 | 7,182 | 15,475 |
| Exotic | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2,376 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,376 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 4,926 | 158 | 4,548 | -- | -- | -- | -- | -- |
| All types | | | | | | | | |
| Sawtimber | 5,493,659 | -- | 4,490 | 4,458 | 44,099 | 106,531 | 60,482 | 158,137 |
| Poletimber | 3,348,181 | -- | 1,253 | 9,841 | 93,158 | 58,497 | 49,317 | 101,037 |
| Sapling & seedling | 548,441 | 6,586 | 27,865 | 28,627 | 46,342 | 90,485 | 47,424 | 91,834 |
| Nonstocked | 4,926 | 158 | 4,548 | -- | -- | -- | -- | -- |
| All stands | 9,395,207 | 6,744 | 38,156 | 42,926 | 183,599 | 255,513 | 157,223 | 351,008 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | |
| Sawtimber | 2,330 | -- | -- | -- | -- | -- | -- |
| Poletimber | 2,542 | 4,638 | 3,174 | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | 1,310 | -- | -- |
| All stands | 4,872 | 4,638 | 3,174 | -- | 1,310 | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 7,253 | -- | -- | 6,718 | -- | -- | -- |
| Poletimber | 4,526 | 3,949 | 559 | 2,932 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 11,779 | 3,949 | 559 | 9,650 | -- | -- | -- |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 41,392 | -- | 2,425 | 41,899 | 87,943 | 74,154 | 17,325 |
| Poletimber | 7,576 | -- | 29,290 | 11,995 | 64,506 | 10,353 | -- |
| Sapling & seedling | 3,601 | 1,246 | 6,619 | -- | 3,349 | -- | -- |
| All stands | 52,569 | 1,246 | 38,334 | 53,894 | 155,798 | 84,507 | 17,325 |
| Maple-birch | | | | | | | |
| Sawtimber | 239,022 | 212,675 | 396,956 | 736,255 | 786,032 | 318,214 | 236,169 |
| Poletimber | 70,245 | 114,039 | 178,535 | 220,289 | 460,146 | 202,402 | 14,172 |
| Sapling & seedling | 40,693 | 20,588 | 10,484 | 25,635 | 1,865 | -- | -- |
| All stands | 349,960 | 347,302 | 585,975 | 982,179 | 1,248,043 | 520,616 | 250,341 |
| Aspen | | | | | | | |
| Sawtimber | 33,226 | 21,797 | 38,743 | 17,322 | 125,378 | 50,720 | 55,216 |
| Poletimber | 21,783 | 73,006 | 97,685 | 80,199 | 107,037 | 94,919 | 31,535 |
| Sapling & seedling | 7,290 | 4,006 | 2,211 | 2,601 | -- | -- | -- |
| All stands | 62,299 | 98,809 | 138,639 | 100,122 | 232,415 | 145,639 | 86,751 |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | -- | 6,799 | 27,248 | -- | -- |
| Poletimber | 7,738 | -- | 33,714 | 20,186 | 25,133 | 12,114 | 7,237 |
| Sapling & seedling | -- | 1,786 | -- | -- | -- | -- | -- |
| All stands | 7,738 | 1,786 | 33,714 | 26,985 | 52,381 | 12,114 | 7,237 |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | 2,376 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | 2,376 | -- | -- | -- |
| Nonstocked | 220 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 469,234 | 268,072 | 548,910 | 1,357,680 | 1,257,826 | 647,189 | 566,551 |
| Poletimber | 217,032 | 230,643 | 481,831 | 544,399 | 856,592 | 502,207 | 202,374 |
| Sapling & seedling | 63,442 | 44,032 | 26,728 | 47,219 | 19,135 | 7,437 | 1,285 |
| Nonstocked | 220 | -- | -- | -- | -- | -- | -- |
| All stands | 749,928 | 542,747 | 1,057,469 | 1,949,298 | 2,133,553 | 1,156,833 | 770,210 |

[1] International 1/4-inch rule.

Table 40.--Net volume of sawtimber on commercial forest land by species group and log-grade, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All grades | Log grade |  |  |  |
|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | Tie and timber |
| SOFTWOODS |  |  |  |  |  |
| White pine | 736,589 | 70,428 | 92,808 | 438,261 | 135,092 |
| Red pine | 447,746 | 19,086 | 11,467 | 400,081 | 17,112 |
| Jack pine | 309,368 | -- | 3,566 | 305,780 | 22 |
| White spruce | 527,783 | -- | 11,389 | 516,394 | -- |
| Black spruce | 169,698 | 34 | 115 | 169,549 | -- |
| Balsam fir | 323,226 | -- | -- | 313,529 | 9,697 |
| Hemlock | 661,391 | 10,360 | 46,105 | 577,252 | 27,674 |
| Tamarack | 66,942 | 737 | 2,615 | 63,590 | -- |
| Northern white-cedar | 996,280 | 11,088 | 16,383 | 968,809 | -- |
| Other softwoods | 1,602 | -- | -- | 1,602 | -- |
| Total | 4,240,625 | 111,733 | 184,448 | 3,754,847 | 189,597 |
| HARDWOODS |  |  |  |  |  |
| Select white oaks | 637 | -- | 278 | 300 | 59 |
| Select red oaks | 65,731 | -- | 30,399 | 30,491 | 4,841 |
| Other red oaks | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- |
| Yellow birch | 367,659 | 31,523 | 130,329 | 160,526 | 45,281 |
| Hard maple | 1,366,336 | 111,798 | 438,140 | 717,466 | 98,932 |
| Soft maple | 947,043 | 61,529 | 200,089 | 592,249 | 93,176 |
| Beech | 653,154 | 24,710 | 118,705 | 453,626 | 56,113 |
| Ash | 88,096 | 11,934 | 19,422 | 39,173 | 17,567 |
| Balsam poplar | 278,417 | 3,473 | 28,509 | 227,251 | 19,184 |
| Cottonwood | 1,936 | 10 | 483 | 1,285 | 158 |
| Bigtooth aspen | 112,159 | 701 | 38,598 | 65,884 | 6,976 |
| Quaking aspen | 638,290 | 6,737 | 109,576 | 437,033 | 84,944 |
| Basswood | 132,115 | -- | 36,211 | 92,918 | 2,986 |
| Yellow-poplar | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- |
| Black cherry | 91,220 | -- | 634 | 82,630 | 7,956 |
| Butternut | -- | -- | -- | -- | -- |
| Elm | 124,011 | 12,939 | 57,247 | 33,150 | 20,675 |
| Paper birch | 287,113 | 12,526 | 54,313 | 197,770 | 22,504 |
| Other hardwoods | 665 | -- | -- | 618 | 47 |
| Total | 5,154,582 | 277,880 | 1,262,933 | 3,132,370 | 481,399 |
| All species | 9,395,207 | 389,613 | 1,447,381 | 6,887,217 | 670,996 |

[1] International 1/4-inch rule.

Table 41.--Net volume of short-log trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39-0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 1,458 | 455 | 409 | 273 | 153 | -- | 71 | -- | 97 | -- | -- |
| Red pine | 110 | 110 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 1,004 | 784 | 83 | 61 | 76 | -- | -- | -- | -- | -- | -- |
| White spruce | 435 | 106 | 74 | -- | -- | 160 | 95 | -- | -- | -- | -- |
| Black spruce | 360 | 284 | 76 | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 1,322 | 469 | 636 | 130 | -- | 87 | -- | -- | -- | -- | -- |
| Hemlock | 2,884 | 628 | 575 | 514 | 315 | 230 | 361 | 90 | 171 | -- | -- |
| Tamarack | 123 | 123 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 9,100 | 2,502 | 2,005 | 1,780 | 769 | 582 | 828 | 152 | 358 | 124 | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 16,796 | 5,461 | 3,858 | 2,758 | 1,313 | 1,059 | 1,355 | 242 | 626 | 124 | -- |
| HARDWOODS | | | | | | | | | | | -- |
| Select white oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 811 | -- | 172 | 94 | 95 | -- | -- | 334 | 116 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 5,090 | -- | 1,136 | 849 | 688 | 810 | 486 | 193 | 479 | 449 | -- |
| Hard maple | 11,404 | -- | 4,832 | 2,195 | 1,303 | 1,307 | 657 | 208 | 542 | 360 | -- |
| Soft maple | 7,212 | -- | 2,112 | 1,390 | 1,973 | 852 | 85 | 512 | 288 | -- | -- |
| Beech | 6,340 | -- | 1,386 | 1,365 | 727 | 803 | 772 | 497 | 790 | -- | -- |
| Ash | 1,317 | -- | 706 | 319 | 202 | 90 | -- | -- | -- | -- | -- |
| Balsam poplar | 834 | -- | 444 | 129 | -- | 94 | 167 | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 482 | -- | 79 | -- | 226 | 93 | -- | 84 | -- | -- | -- |
| Quaking aspen | 4,210 | -- | 1,794 | 1,587 | 561 | 175 | -- | 93 | -- | -- | -- |
| Basswood | 829 | -- | 251 | 291 | 192 | -- | -- | 95 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 602 | -- | 225 | 227 | 76 | 74 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 105 | -- | -- | -- | -- | 105 | -- | -- | -- | -- | -- |
| Paper birch | 2,365 | -- | 917 | 649 | 317 | 157 | 238 | -- | 87 | -- | -- |
| Other hardwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 41,601 | -- | 14,054 | 9,095 | 6,360 | 4,560 | 2,405 | 2,016 | 2,302 | 809 | -- |
| All species | 58,397 | 5,461 | 17,912 | 11,853 | 7,673 | 5,619 | 3,760 | 2,258 | 2,928 | 933 | -- |

Table 42.--Net volume of short-log trees on commercial forest land by species group and diameter class, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)1/

| Species group | All classes | Diameter class (inches at breast height) 9.0 10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39-0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 5,438 | 1,961 | 1,424 | 950 | 506 | -- | 349 | -- | 248 | -- | -- |
| Red pine | 468 | 468 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 4,019 | 3,415 | 312 | 39 | 253 | -- | -- | -- | -- | -- | -- |
| White spruce | 1,472 | 425 | 289 | -- | -- | 481 | 277 | -- | -- | -- | -- |
| Black spruce | 1,590 | 1,177 | 413 | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 5,184 | 1,886 | 2,579 | 454 | -- | 265 | -- | -- | -- | -- | -- |
| Hemlock | 10,779 | 2,821 | 2,442 | 1,798 | 933 | 689 | 1,326 | 243 | 527 | -- | -- |
| Tamarack | 505 | 505 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 28,923 | 11,369 | 7,354 | 5,159 | 1,861 | 1,073 | 1,345 | 236 | 422 | 104 | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 58,378 | 24,027 | 14,813 | 8,400 | 3,553 | 2,508 | 3,297 | 479 | 1,197 | 104 | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 2,279 | -- | 419 | 249 | 268 | -- | -- | 997 | 346 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 24,611 | -- | 7,867 | 4,838 | 3,119 | 3,450 | 1,915 | 652 | 1,474 | 1,296 | -- |
| Hard maple | 29,647 | -- | 12,988 | 6,516 | 3,852 | 3,147 | 1,472 | 424 | 951 | 297 | -- |
| Soft maple | 22,482 | -- | 6,487 | 4,252 | 6,384 | 2,670 | 279 | 1,526 | 884 | -- | -- |
| Beech | 17,511 | -- | 3,259 | 3,401 | 1,912 | 2,446 | 2,346 | 1,646 | 2,501 | -- | -- |
| Ash | 3,386 | -- | 1,732 | 830 | 563 | 261 | -- | -- | -- | -- | -- |
| Balsam poplar | 2,111 | -- | 1,127 | 197 | -- | 272 | 515 | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,142 | -- | 232 | -- | 498 | 235 | -- | 177 | -- | -- | -- |
| Quaking aspen | 11,399 | -- | 5,119 | 4,334 | 1,341 | 419 | -- | 186 | -- | -- | -- |
| Basswood | 2,219 | -- | 628 | 763 | 539 | -- | -- | 289 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,956 | -- | 542 | 898 | 244 | 272 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 296 | -- | -- | -- | -- | 296 | -- | -- | -- | -- | -- |
| Paper birch | 6,793 | -- | 2,156 | 1,815 | 953 | 531 | 934 | -- | 404 | -- | -- |
| Other hardwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 125,832 | -- | 42,556 | 28,093 | 19,673 | 13,999 | 7,461 | 5,897 | 6,560 | 1,593 | -- |
| All species | 184,210 | 24,027 | 57,369 | 36,493 | 23,226 | 16,507 | 10,758 | 6,376 | 7,757 | 1,697 | -- |

1/International 1/4-inch rule.

Table 43.--Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1965 and 1979

(In million cubic feet)

| Species | 1965 | 1979 |
|---|---|---|
| Softwoods | 40.6 | 59.5 |
| Hardwoods | 60.6 | 72.7 |
| All species | 101.2 | 132.2 |

1/Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 44.--Net annual growth of growing stock on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All counties | County | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| SOFTWOODS | | | | | | | | |
| White pine | 4,426 | 578 | 501 | 387 | 967 | 400 | 701 | 892 |
| Red pine | 6,437 | 974 | 1,428 | 1,253 | 768 | 824 | 134 | 1,056 |
| Jack pine | 7,527 | 475 | 2,875 | 949 | 1,354 | 523 | 226 | 1,125 |
| White spruce | 7,252 | 1,051 | 1,435 | 1,104 | 752 | 1,727 | 469 | 714 |
| Black spruce | 6,570 | 198 | 1,745 | 1,120 | 679 | 1,150 | 576 | 1,102 |
| Balsam fir | 6,263 | 722 | 1,404 | 1,128 | 309 | 981 | 564 | 1,155 |
| Hemlock | 3,090 | 849 | 249 | 468 | 642 | 176 | 328 | 378 |
| Tamarack | 849 | -14 | 127 | 130 | 163 | -3 | 217 | 229 |
| Northern white-cedar | 17,080 | 1,399 | 2,109 | 2,783 | 1,526 | 2,754 | 3,937 | 2,572 |
| Other softwoods | 51 | -- | 32 | -- | 14 | -- | -- | 5 |
| Total | 59,545 | 6,232 | 11,905 | 9,322 | 7,174 | 8,532 | 7,152 | 9,228 |
| HARDWOODS | | | | | | | | |
| Select white oak | 12 | -- | -- | -- | -- | -- | 12 | -- |
| Select red oaks | 816 | 3 | 281 | 51 | 33 | 38 | 405 | 5 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 1,621 | 369 | 138 | 135 | 287 | 221 | 322 | 149 |
| Hard maple | 18,589 | 4,682 | 2,775 | 1,814 | 2,490 | 2,275 | 2,869 | 1,684 |
| Soft maple | 20,833 | 3,922 | 3,571 | 2,781 | 3,685 | 2,406 | 1,637 | 2,831 |
| Beech | 4,169 | 1,544 | 651 | 239 | 792 | 411 | 50 | 482 |
| Ash | 6,172 | 689 | 544 | 1,395 | 614 | 214 | 2,456 | 260 |
| Balsam poplar | 2,093 | 106 | 483 | 607 | 62 | 388 | 299 | 148 |
| Cottonwood | 15 | -- | 15 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,956 | 66 | 247 | 336 | 267 | 505 | 143 | 392 |
| Quaking aspen | 10,834 | 440 | 2,444 | 2,208 | 887 | 1,452 | 2,335 | 1,068 |
| Basswood | 2,020 | 242 | 263 | 405 | 51 | 310 | 686 | 63 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,989 | 650 | 215 | 150 | 415 | 154 | 94 | 311 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -5,230 | -2,642 | -49 | -635 | -151 | -540 | -1,230 | 17 |
| Paper birch | 6,791 | 103 | 1,057 | 1,068 | 491 | 1,352 | 1,478 | 1,242 |
| Other hardwoods | 10 | 4 | 6 | -- | -- | -- | -- | -- |
| Total | 72,690 | 10,178 | 12,641 | 10,554 | 9,923 | 9,186 | 11,556 | 8,652 |
| All species | 132,235 | 16,410 | 24,546 | 19,876 | 17,097 | 17,718 | 18,708 | 17,880 |

Table 45.--Net annual growth of sawtimber on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)1/

| Species group | All counties | County |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 25,973 | 4,600 | 3,110 | 1,877 | 5,880 | 2,008 | 4,225 | 4,273 |
| Red pine | 23,613 | 2,431 | 3,964 | 4,114 | 3,430 | 5,316 | 212 | 4,146 |
| Jack pine | 23,253 | 657 | 7,443 | 1,722 | 5,533 | 2,635 | 15 | 5,248 |
| White spruce | 33,520 | 3,691 | 5,939 | 7,149 | 2,648 | 7,080 | 3,249 | 3,764 |
| Black spruce | 5,452 | 234 | 691 | 414 | 2,074 | 163 | 1,201 | 675 |
| Balsam fir | 15,119 | 1,694 | 1,880 | 1,798 | 1,938 | 2,803 | 1,671 | 3,335 |
| Hemlock | 19,709 | 5,107 | 1,655 | 2,279 | 5,692 | 808 | 1,585 | 2,583 |
| Tamarack | 3,203 | -21 | 690 | 611 | 288 | 383 | 639 | 613 |
| Northern white-cedar | 40,382 | 4,725 | 5,728 | 5,795 | 6,984 | 7,832 | 4,041 | 5,277 |
| Other softwoods | 387 | -- | 27 | -- | 360 | -- | -- | -- |
| Total | 190,611 | 23,118 | 31,127 | 25,759 | 34,827 | 29,028 | 16,838 | 29,914 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 22 | -- | -- | -- | -- | -- | 22 | -- |
| Select red oaks | 2,758 | -- | 546 | 236 | 546 | 547 | 883 | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 8,178 | 4,273 | 844 | 263 | 369 | 1,887 | 79 | 463 |
| Hard maple | 65,882 | 15,513 | 7,618 | 5,327 | 11,514 | 9,199 | 9,479 | 7,232 |
| Soft maple | 55,522 | 13,695 | 10,024 | 3,960 | 11,499 | 5,182 | 1,459 | 9,703 |
| Beech | 18,805 | 5,802 | 3,490 | 1,327 | 4,277 | 855 | 717 | 2,337 |
| Ash | 12,098 | 442 | 2,184 | 2,921 | 608 | 826 | 4,905 | 212 |
| Balsam poplar | 8,986 | 41 | 2,542 | 2,162 | 669 | 2,428 | 381 | 763 |
| Cottonwood | 77 | -- | 77 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 4,336 | 176 | 1,527 | 276 | 630 | 906 | 677 | 144 |
| Quaking aspen | 58,263 | 5,979 | 21,605 | 9,301 | 4,321 | 9,220 | 4,619 | 3,218 |
| Basswood | 8,150 | 1,221 | 404 | 620 | 118 | 550 | 4,974 | 263 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 8,833 | 3,114 | 846 | 1,734 | 710 | 491 | 12 | 1,926 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -12,244 | -6,762 | 971 | -1,601 | -241 | -1,616 | -3,372 | 377 |
| Paper birch | 17,076 | 1,045 | 5,173 | 4,311 | 1,884 | 549 | 871 | 3,243 |
| Other hardwoods | 13 | 13 | -- | -- | -- | -- | -- | -- |
| Total | 256,755 | 44,552 | 57,851 | 30,837 | 36,904 | 31,024 | 25,706 | 29,881 |
| All species | 447,366 | 67,670 | 88,978 | 56,596 | 71,731 | 60,052 | 42,544 | 59,795 |

1/International 1/4-inch rule.

## Table 46.--Net annual growth of growing stock on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| | | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All owners | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 4,426 | 671 | -- | 28 | -- | 1,677 | 4 | 745 | 298 | 415 | 588 |
| Red pine | 6,437 | 3,768 | -- | 45 | -- | 1,907 | 103 | 93 | 208 | 104 | 209 |
| Jack pine | 7,527 | 3,338 | -- | 144 | -- | 3,215 | 11 | 174 | 121 | 98 | 426 |
| White spruce | 7,252 | 1,945 | -- | 97 | -- | 1,383 | 8 | 936 | 780 | 622 | 1,481 |
| Black spruce | 6,570 | 2,048 | -- | -- | 6 | 2,140 | -- | 741 | 350 | 486 | 799 |
| Balsam fir | 6,263 | 916 | -- | 23 | 3 | 600 | 5 | 946 | 1,247 | 665 | 1,858 |
| Hemlock | 3,090 | 419 | -- | 5 | -- | 580 | -- | 1,029 | 298 | 192 | 567 |
| Tamarack | 849 | -26 | -- | -- | 2 | 733 | 68 | 178 | -21 | -1 | -84 |
| Northern white-cedar | 17,080 | 1,343 | -- | 6 | 6 | 4,537 | 30 | 4,181 | 2,488 | 1,214 | 3,275 |
| Other softwoods | 51 | -- | -- | -- | -- | -- | -- | -- | 32 | 5 | 14 |
| Total | 59,545 | 14,422 | -- | 348 | 17 | 16,772 | 229 | 9,023 | 5,801 | 3,800 | 9,133 |
| HARDWOODS | | | | | | | | | | | |
| Select white oak | 12 | -- | -- | -- | -- | 4 | -- | -- | -- | 5 | 3 |
| Select red oaks | 816 | 22 | -- | -- | -- | 225 | -- | 3 | 64 | 87 | 415 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 1,621 | 110 | -- | 29 | -- | 275 | 8 | 300 | 154 | 182 | 563 |
| Hard maple | 18,589 | 1,981 | -- | 10 | 71 | 3,033 | 15 | 4,319 | 3,400 | 944 | 4,816 |
| Soft maple | 20,833 | 3,170 | -- | 24 | 6 | 5,179 | 64 | 4,638 | 1,927 | 1,600 | 4,225 |
| Beech | 4,169 | 1,010 | -- | -- | -- | 373 | -- | 1,763 | 110 | 186 | 727 |
| Ash | 6,172 | 117 | -- | 7 | 96 | 1,336 | -- | 1,211 | 1,292 | 266 | 1,847 |
| Balsam poplar | 2,093 | -218 | -- | -- | 1 | 506 | -- | 235 | 634 | 158 | 777 |
| Cottonwood | 15 | -- | -- | -- | -- | 15 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,956 | 495 | -- | -- | 1 | 791 | -- | 68 | 87 | 265 | 249 |
| Quaking aspen | 10,834 | 2,016 | -- | 15 | 9 | 1,862 | -- | 1,203 | 2,195 | 576 | 2,958 |
| Basswood | 2,020 | 146 | -- | -- | 8 | 324 | -- | 305 | 517 | 146 | 574 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,989 | 743 | -- | -- | 5 | 272 | 13 | 448 | 140 | 39 | 329 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -5,230 | 245 | -- | -- | -130 | -1,645 | -- | -648 | -2,007 | -122 | -923 |
| Paper birch | 6,791 | 386 | -- | 38 | 15 | 2,097 | -- | 893 | 927 | 800 | 1,635 |
| Other hardwoods | 10 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 6 |
| Total | 72,690 | 10,223 | -- | 123 | 82 | 14,647 | 100 | 14,742 | 9,440 | 5,132 | 18,201 |
| All species | 132,235 | 24,645 | -- | 471 | 99 | 31,419 | 329 | 23,765 | 15,241 | 8,932 | 27,334 |

Table 47.--Net annual growth of sawtimber on commercial forest land by species group and ownership class, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 25,973 | 4,272 | -- | -- | -- | 10,506 | 20 | 4,071 | 1,303 | 2,529 | 3,272 |
| Red pine | 23,613 | 11,286 | -- | 935 | -- | 9,017 | -- | 222 | 359 | 426 | 1,368 |
| Jack pine | 23,253 | 5,876 | -- | 1,531 | -- | 13,940 | -- | 559 | 663 | 711 | -27 |
| White spruce | 33,520 | 12,581 | -- | 101 | -- | 7,014 | -- | 2,827 | 3,385 | 3,273 | 4,339 |
| Black spruce | 5,452 | 1,217 | -- | -- | -- | 3,108 | -- | 1,632 | -2 | -222 | -281 |
| Balsam fir | 15,119 | 1,039 | -- | 497 | 429 | 3,141 | -- | 1,670 | 2,188 | 1,377 | 4,778 |
| Hemlock | 19,709 | 2,251 | -- | 28 | -- | 4,235 | -- | 8,239 | 770 | 1,349 | 2,837 |
| Tamarack | 3,203 | 75 | -- | -- | -- | 1,424 | -- | 395 | 796 | 415 | 98 |
| Northern white-cedar | 40,382 | 2,278 | -- | 9 | 9 | 13,723 | 8 | 9,084 | 5,549 | 2,345 | 7,377 |
| Other softwoods | 387 | -- | -- | -- | -- | -- | -- | -- | 27 | -- | 360 |
| Total | 190,611 | 40,875 | -- | 3,101 | 438 | 66,108 | 28 | 28,699 | 15,038 | 12,203 | 24,121 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 22 |
| Select red oaks | 2,758 | -- | -- | -- | -- | 422 | -- | -- | 264 | 161 | 1,911 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 8,178 | 302 | -- | 75 | -- | 1,073 | 24 | 3,639 | 1,207 | 669 | 1,189 |
| Hard maple | 65,882 | 6,789 | -- | 36 | 595 | 9,195 | -- | 16,057 | 10,772 | 1,325 | 21,113 |
| Soft maple | 55,522 | 6,281 | -- | -- | -- | 11,434 | 192 | 17,479 | 5,011 | 1,654 | 13,471 |
| Beech | 18,805 | 2,906 | -- | -- | -- | 642 | -- | 7,759 | 981 | 1,230 | 5,287 |
| Ash | 12,098 | -- | -- | -- | -- | 2,114 | -- | 2,373 | 3,614 | 206 | 3,791 |
| Balsam poplar | 8,986 | -274 | -- | -- | 5 | 877 | -- | 2,101 | 1,799 | 1,464 | 3,014 |
| Cottonwood | 77 | -- | -- | -- | -- | 77 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 4,336 | 846 | -- | -- | 8 | 1,388 | -- | 686 | 685 | 21 | 702 |
| Quaking aspen | 58,263 | 12,365 | -- | -- | 12 | 13,474 | -- | 1,626 | 10,749 | 4,039 | 15,998 |
| Basswood | 8,150 | 1,173 | -- | -- | 53 | 923 | -- | 2,179 | 2,253 | 259 | 1,310 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 8,833 | 4,562 | -- | -- | -- | 736 | 5 | 1,880 | 1,525 | 36 | 89 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -12,244 | 2,856 | -- | -- | -551 | -5,471 | -- | -1,767 | -6,043 | -324 | -944 |
| Paper birch | 17,076 | -51 | -- | 20 | -- | 4,360 | -- | 1,885 | 5,657 | 1,316 | 3,889 |
| Other hardwoods | 13 | -- | -- | -- | -- | -- | -- | 13 | -- | -- | -- |
| Total | 256,755 | 37,755 | -- | 131 | 122 | 41,244 | 221 | 55,910 | 38,474 | 12,056 | 70,842 |
| All species | 447,366 | 78,630 | -- | 3,232 | 560 | 107,352 | 249 | 84,609 | 53,512 | 24,259 | 94,963 |

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[1] International 1/4-inch rule.

Table 48.--Net annual growth of growing stock on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 4,426 | 158 | 239 | 1,458 | 262 | 77 | 362 | 386 |
| Red pine | 6,437 | 929 | 4,782 | 164 | 10 | 44 | 156 | 3 |
| Jack pine | 7,527 | 5,941 | 806 | 63 | 0 | 28 | 442 | -- |
| White spruce | 7,252 | 19 | 159 | 256 | 2,116 | 768 | 57 | 334 |
| Black spruce | 6,570 | 298 | 20 | 28 | 225 | 8 | 5,181 | 230 |
| Balsam fir | 6,263 | 3 | 23 | 39 | 2,614 | -67 | 314 | -2,625 |
| Hemlock | 3,090 | -- | -- | 35 | 94 | 3 | 44 | 123 |
| Tamarack | 849 | 4 | 7 | 12 | 15 | 6 | 38 | -243 |
| Northern white-cedar | 17,080 | 5 | 6 | 168 | 373 | 170 | 224 | 12,317 |
| Other softwoods | 51 | -- | 14 | -- | 5 | -- | -- | -- |
| Total | 59,545 | 7,357 | 6,056 | 2,223 | 5,714 | 1,037 | 6,818 | 10,525 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 12 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 816 | 30 | -- | -- | -- | -- | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 1,621 | -- | -- | -- | 42 | 2 | 3 | 258 |
| Hard maple | 18,589 | 0 | 0 | 12 | 21 | 2 | 16 | 39 |
| Soft maple | 20,833 | 103 | 187 | 239 | 522 | 49 | 151 | 730 |
| Beech | 4,169 | -- | -- | 8 | 6 | 1 | -- | -- |
| Ash | 6,172 | -- | -- | -- | 85 | -- | -- | 1,003 |
| Balsam poplar | 2,093 | -- | -- | 14 | 80 | 10 | 9 | 187 |
| Cottonwood | 15 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,956 | 42 | 155 | 10 | 12 | 0 | 54 | 8 |
| Quaking aspen | 10,834 | 150 | 341 | 58 | 455 | 45 | 759 | 265 |
| Basswood | 2,020 | -- | -- | -- | 4 | -- | -- | 17 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,989 | 4 | 19 | -- | 3 | -- | 6 | 2 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -5,230 | -- | -- | -- | -193 | -22 | -- | -128 |
| Paper birch | 6,791 | 13 | 11 | 100 | 291 | 30 | 132 | 650 |
| Other hardwoods | 10 | -- | -- | -- | -- | -- | -- | -- |
| Total | 72,690 | 342 | 713 | 441 | 1,328 | 117 | 1,130 | 3,031 |
| All species | 132,235 | 7,699 | 6,769 | 2,664 | 7,042 | 1,154 | 7,948 | 13,556 |

(Table 48 continued on next page)

(Table 48 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 11 | 15 | 87 | 994 | 317 | 56 | -- | 4 |
| Red pine | 7 | 12 | 7 | 44 | 237 | 16 | 11 | 15 |
| Jack pine | -- | 1 | -- | 36 | 191 | 0 | -- | 19 |
| White spruce | -- | 86 | 193 | 1,085 | 1,815 | 371 | -- | -7 |
| Black spruce | 49 | -- | 32 | -76 | 489 | 82 | -- | 4 |
| Balsam fir | 14 | 4 | 844 | 1,316 | 3,209 | 507 | -- | 68 |
| Hemlock | -- | -- | 254 | 2,356 | 139 | 42 | -- | -- |
| Tamarack | 884 | -- | 48 | 3 | 65 | 4 | -- | 6 |
| Northern white-cedar | 221 | -- | 629 | 917 | 1,704 | 341 | -- | 5 |
| Other softwoods | -- | -- | -- | -- | -- | -- | 32 | -- |
| Total | 1,186 | 118 | 2,094 | 6,675 | 8,166 | 1,419 | 43 | 114 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 7 | -- | -- | -- | 5 | -- | -- |
| Select red oaks | -- | 398 | 11 | 135 | 220 | 22 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | 273 | 920 | 111 | 12 | -- | -- |
| Hard maple | -- | 3 | 91 | 17,726 | 590 | 89 | -- | -- |
| Soft maple | -- | 117 | 2,414 | 13,555 | 2,080 | 685 | -- | 1 |
| Beech | -- | -- | 12 | 4,134 | 8 | -- | -- | -- |
| Ash | -- | -- | 2,630 | 1,556 | 777 | 121 | -- | -- |
| Balsam poplar | 7 | -- | 79 | 70 | 1,541 | 98 | -- | -2 |
| Cottonwood | -- | -- | -- | 15 | -- | -- | -- | -- |
| Bigtooth aspen | -- | 23 | 13 | 151 | 1,446 | 41 | -- | 1 |
| Quaking aspen | 18 | 30 | 103 | 737 | 7,529 | 276 | -- | 68 |
| Basswood | -- | 10 | 23 | 1,870 | 96 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 6 | 13 | 1,843 | 93 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | -- | -898 | -3,430 | -548 | -11 | -- | -- |
| Paper birch | 17 | 25 | 334 | 640 | 2,579 | 1,966 | -- | 3 |
| Other hardwoods | -- | -- | -- | 4 | 6 | -- | -- | -- |
| Total | 42 | 619 | 5,098 | 39,926 | 16,528 | 3,304 | -- | 71 |
| All species | 1,228 | 737 | 7,192 | 46,601 | 24,694 | 4,723 | 43 | 185 |

## Table 49.--Net annual growth of sawtimber on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1]

| | | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All types | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 25,973 | 712 | 1,842 | 9,591 | 1,501 | 336 | 1,818 | 2,203 |
| Red pine | 23,613 | 5,274 | 16,232 | 645 | 21 | 101 | 432 | 14 |
| Jack pine | 23,253 | 18,578 | 1,630 | 482 | -- | 78 | 1,560 | -- |
| White spruce | 33,520 | 59 | -- | 856 | 15,536 | 2,438 | 89 | 1,359 |
| Black spruce | 5,452 | 19 | 86 | -445 | 1,409 | -11 | 4,119 | 753 |
| Balsam fir | 15,119 | -- | 54 | 32 | 4,513 | 710 | 699 | -6,100 |
| Hemlock | 19,709 | -- | -- | 906 | 416 | 21 | 196 | 1,433 |
| Tamarack | 3,203 | -- | 43 | 58 | 530 | -- | 30 | 188 |
| Northern white-cedar | 40,382 | -- | 8 | 39 | 2,207 | 210 | 554 | 27,870 |
| Other softwoods | 387 | -- | 360 | -- | -- | -- | -- | -- |
| Total | 190,611 | 24,642 | 20,255 | 12,164 | 26,133 | 3,883 | 9,497 | 27,720 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 22 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 2,758 | 22 | -- | -- | -- | -- | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 8,178 | -- | -- | -- | 146 | -1 | -- | 777 |
| Hard maple | 65,882 | -- | -- | 49 | -- | -- | 5 | 93 |
| Soft maple | 55,522 | -- | -- | 97 | 968 | -- | 89 | 2,019 |
| Beech | 18,805 | -- | -- | -- | -- | 10 | -- | -- |
| Ash | 12,098 | -- | -- | -- | 25 | -- | -- | 1,976 |
| Balsam poplar | 8,986 | -- | -- | 17 | 574 | 1 | 4 | 1,446 |
| Cottonwood | 77 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 4,336 | -- | 277 | -32 | 6 | 0 | 595 | 12 |
| Quaking aspen | 58,263 | -- | 27 | 37 | 3,111 | 97 | 609 | 451 |
| Basswood | 8,150 | -- | -- | -- | 28 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 8,833 | -- | 6 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -12,244 | -- | -- | -- | -645 | -131 | -- | -552 |
| Paper birch | 17,076 | -- | -- | 69 | 168 | 4 | 62 | 1,479 |
| Other hardwoods | 13 | -- | -- | -- | -- | -- | -- | -- |
| Total | 256,755 | 22 | 310 | 237 | 4,381 | -20 | 1,364 | 7,701 |
| All species | 447,366 | 24,664 | 20,565 | 12,401 | 30,514 | 3,863 | 10,861 | 35,421 |

(Table 49 continued on next page)

[1] International 1/4-inch rule.

(Table 49 continued)

| Species group | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | 414 | 66 | 785 | 4,791 | 1,679 | 212 | -- | 23 |
| Red pine | 36 | 19 | -- | 209 | 484 | 86 | 58 | 2 |
| Jack pine | -- | 26 | -- | 131 | 736 | -- | -- | 32 |
| White spruce | -- | 42 | 591 | 3,454 | 6,713 | 2,386 | -- | -3 |
| Black spruce | 7 | -- | 34 | -562 | 25 | -- | -- | 18 |
| Balsam fir | -- | -- | 1,909 | 5,799 | 6,059 | 1,423 | -- | 21 |
| Hemlock | -- | -- | 1,759 | 14,508 | 301 | 169 | -- | -- |
| Tamarack | 1,044 | -- | 103 | 17 | 1,110 | 29 | -- | 51 |
| Northern white-cedar | 124 | -- | 1,207 | 3,587 | 4,166 | 399 | -- | 11 |
| Other softwoods | -- | -- | -- | -- | -- | -- | 27 | -- |
| Total | 1,625 | 153 | 6,388 | 31,934 | 21,273 | 4,704 | 85 | 155 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 22 | -- | -- | -- | -- | -- | -- |
| Select red oaks | -- | 1,483 | 12 | 1,032 | 164 | 45 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | 312 | 6,865 | 78 | 1 | -- | -- |
| Hard maple | -- | -- | 87 | 63,453 | 1,930 | 265 | -- | -- |
| Soft maple | -- | 459 | 7,116 | 43,393 | 794 | 587 | -- | -- |
| Beech | -- | -- | 22 | 18,773 | -- | -- | -- | -- |
| Ash | -- | -- | 3,735 | 3,900 | 2,462 | -- | -- | -- |
| Balsam poplar | -- | -- | 122 | 734 | 6,028 | 75 | -- | -15 |
| Cottonwood | -- | -- | -- | 77 | -- | -- | -- | -- |
| Bigtooth aspen | -- | 31 | 57 | 905 | 2,442 | 43 | -- | -- |
| Quaking aspen | -- | 13 | 122 | 8,057 | 43,888 | 1,830 | -- | 21 |
| Basswood | -- | 69 | -- | 6,919 | 1,134 | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | -- | 1,313 | 7,502 | 12 | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | -- | -2,698 | -7,154 | -1,064 | -- | -- | -- |
| Paper birch | -- | -- | 2,290 | 4,234 | 3,923 | 4,847 | -- | -- |
| Other hardwoods | -- | -- | -- | 13 | -- | -- | -- | -- |
| Total | -- | 2,077 | 12,490 | 158,703 | 61,791 | 7,693 | -- | 6 |
| All species | 1,625 | 2,230 | 18,878 | 190,637 | 83,064 | 12,397 | 85 | 161 |

Table 50.--Net annual growth of growing stock on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 7,699 | 182 | 144 | 684 | 1,705 | 3,182 | 926 | 499 | 213 | 164 | -- | -- | -- | -- |
| Red pine | 6,769 | 114 | 446 | 2,169 | 2,459 | 473 | 137 | 419 | 234 | 24 | 63 | 231 | -- | -- |
| White pine | 2,664 | 35 | 53 | 98 | 54 | 206 | 301 | 495 | 477 | 93 | 84 | 322 | 160 | 286 |
| Balsam fir | 7,042 | 594 | 807 | 131 | 1,827 | 1,422 | 1,310 | 234 | 394 | 100 | -45 | 215 | 53 | -- |
| White spruce | 1,154 | 5 | 110 | 32 | -- | 565 | 142 | -23 | 146 | 132 | -- | 45 | -- | -- |
| Black spruce | 7,948 | 596 | 664 | 1,034 | 2,874 | 664 | 1,029 | 527 | 256 | 168 | 78 | 26 | -- | 32 |
| Northern white-cedar | 13,556 | 59 | 794 | 1,134 | 1,544 | 832 | 923 | 2,637 | 1,048 | 1,304 | 1,084 | 1,028 | 639 | 530 |
| Tamarack | 1,228 | 20 | 81 | 94 | 38 | 90 | 338 | 312 | 122 | 29 | 27 | 77 | -- | -- |
| Oak-hickory | 737 | -- | 54 | -- | 19 | 122 | 265 | 120 | -- | 34 | 67 | -- | 56 | -- |
| Elm-ash-soft maple | 7,192 | 532 | 434 | 433 | 409 | 1,038 | 1,197 | 880 | 455 | 319 | 528 | 715 | 210 | 42 |
| Maple-birch | 46,601 | 1,767 | 1,508 | 1,560 | 3,132 | 9,325 | 7,403 | 4,779 | 2,626 | 3,277 | 3,144 | 5,324 | 2,276 | 480 |
| Aspen | 24,694 | 3,489 | 1,918 | 912 | 4,407 | 5,869 | 4,085 | 2,666 | 322 | 303 | 689 | 34 | -- | -- |
| Paper birch | 4,723 | 454 | 127 | 92 | 228 | 1,001 | 1,426 | 889 | 198 | -- | 205 | 103 | -- | -- |
| Exotic | 43 | -- | -- | 43 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 185 | 130 | 12 | -- | 14 | 10 | 12 | -- | -- | 7 | -- | -- | -- | -- |
| All types | 132,235 | 7,977 | 7,152 | 8,416 | 18,710 | 24,799 | 19,494 | 14,434 | 6,491 | 5,954 | 5,924 | 8,120 | 3,394 | 1,370 |

Table 51.--Net annual growth of sawtimber on commercial forest land by forest type and stand-age class, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 24,664 | 754 | 521 | 417 | 5,413 | 7,472 | 2,901 | 4,861 | 1,469 | 856 | -- | -- | -- | -- |
| Red pine | 20,565 | 38 | 1,531 | 1,904 | 8,969 | 3,222 | 965 | 1,846 | 1,068 | 132 | 281 | 609 | -- | -- |
| White pine | 12,401 | 79 | 273 | 218 | 309 | 1,436 | 821 | 2,345 | 1,576 | 497 | 740 | 2,055 | 1,023 | 1,029 |
| Balsam fir | 30,514 | 1,786 | 2,989 | 416 | 3,764 | 11,552 | 5,014 | 635 | 1,092 | 715 | 315 | 1,611 | 625 | -- |
| White spruce | 3,863 | 9 | 291 | -- | -- | 866 | 193 | 1,061 | 284 | 964 | -- | 195 | -- | -- |
| Black spruce | 10,861 | 744 | 1,676 | 3,271 | 1,517 | 1,333 | 1,045 | 884 | 171 | -- | 116 | -- | -- | 104 |
| Northern white-cedar | 35,421 | 1,042 | 664 | 1,412 | 1,178 | 1,229 | 1,989 | 4,991 | 1,574 | 5,292 | 2,525 | 7,144 | 1,664 | 4,717 |
| Tamarack | 1,625 | 36 | 42 | 439 | 60 | 22 | 147 | 144 | 139 | 35 | 94 | 467 | -- | -- |
| Oak-hickory | 2,230 | -- | 24 | -- | 26 | 86 | 471 | 275 | -- | 974 | 198 | -- | 176 | -- |
| Elm-ash-soft maple | 18,878 | 298 | 775 | 279 | 116 | 652 | 3,634 | 1,460 | 2,115 | 2,537 | 1,991 | 3,895 | 988 | 138 |
| Maple-birch | 190,637 | 3,624 | 3,481 | 5,441 | 11,503 | 28,087 | 25,141 | 18,686 | 11,633 | 20,525 | 21,068 | 28,812 | 8,968 | 3,668 |
| Aspen | 83,064 | 5,686 | 2,194 | 917 | 19,184 | 22,517 | 12,576 | 10,551 | 2,379 | 1,695 | 4,426 | 939 | -- | -- |
| Paper birch | 12,397 | 1,645 | 236 | -- | 39 | 4,084 | 2,233 | 1,521 | 872 | -- | 856 | 911 | -- | -- |
| Exotic | 85 | -- | -- | 85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 161 | 8 | 26 | -- | -- | 70 | 35 | -- | -- | 22 | -- | -- | -- | -- |
| All types | 447,366 | 15,749 | 14,723 | 14,799 | 52,078 | 82,628 | 57,165 | 49,260 | 24,372 | 34,244 | 32,610 | 46,638 | 13,444 | 9,656 |

[1] International 1/4-inch rule.

Table 52.--Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | | | | | | | | | | | | | | | |
| Sawtimber | 1,300 | -- | -- | -- | 25 | 167 | 98 | 233 | 333 | 57 | 165 | 222 | -- | -- | -- |
| Poletimber | 6,146 | -- | 12 | 171 | 362 | 363 | 362 | 230 | 553 | 320 | 1,281 | 1,136 | 1,356 | -- | -- |
| Sapling & seedling | 253 | 11 | 46 | 65 | 119 | -- | -- | -- | 12 | -- | -- | -- | -- | -- | -- |
| All stands | 7,699 | 11 | 58 | 236 | 506 | 530 | 460 | 463 | 898 | 377 | 1,446 | 1,358 | 1,356 | -- | -- |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 1,968 | -- | 13 | -- | 24 | 37 | 46 | 71 | 280 | -- | 303 | 347 | 484 | 223 | 140 |
| Poletimber | 4,386 | -- | -- | -- | -- | 88 | 62 | 217 | 712 | -- | -- | 1,305 | 211 | 978 | 813 |
| Sapling & seedling | 415 | -- | 234 | 64 | 98 | -- | 19 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 6,769 | -- | 247 | 64 | 122 | 125 | 127 | 288 | 992 | -- | 303 | 1,652 | 695 | 1,201 | 953 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 1,891 | -- | -- | 19 | 49 | 36 | 151 | 69 | 574 | 30 | 291 | 533 | 56 | 83 | -- |
| Poletimber | 649 | -- | -- | -- | -- | 96 | 50 | 40 | -- | -- | -- | 463 | -- | -- | -- |
| Sapling & seedling | 124 | 11 | 23 | -- | 33 | -- | -- | 57 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,664 | 11 | 23 | 19 | 82 | 132 | 201 | 166 | 574 | 30 | 291 | 996 | 56 | 83 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | 1,338 | -- | -- | -- | -- | -- | 33 | -- | -- | 168 | 203 | 648 | 231 | -- | 55 |
| Poletimber | 4,182 | -- | -- | -- | 24 | 89 | -- | 143 | 436 | 544 | 927 | 744 | 877 | 120 | 278 |
| Sapling & seedling | 1,522 | 6 | -12 | 60 | 359 | 199 | 163 | 351 | 146 | 198 | 39 | 23 | -10 | -- | -- |
| All stands | 7,042 | 6 | -12 | 60 | 383 | 288 | 196 | 494 | 582 | 910 | 1,169 | 1,415 | 1,098 | 120 | 333 |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | 343 | -- | -- | -- | 38 | -- | -- | -- | -- | -- | -- | 44 | 74 | 151 | 36 |
| Poletimber | 664 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 138 | 108 | 310 | -- | 108 |
| Sapling & seedling | 147 | -- | 42 | -- | 27 | -- | -- | 78 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,154 | -- | 42 | -- | 65 | -- | -- | 78 | -- | -- | 138 | 152 | 384 | 151 | 144 |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | 222 | -- | -- | -- | -- | -- | 32 | -- | 20 | 121 | -- | 49 | -- | -- | -- |
| Poletimber | 5,569 | 6 | -- | -- | 485 | 127 | 398 | 282 | 232 | 90 | 460 | 3,002 | 395 | 92 | -- |
| Sapling & seedling | 2,157 | -1 | 142 | 26 | 205 | 231 | 268 | 471 | 70 | 147 | 356 | 215 | 27 | -- | -- |
| All stands | 7,948 | 5 | 142 | 26 | 690 | 358 | 698 | 753 | 322 | 358 | 816 | 3,266 | 422 | 92 | -- |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | 2,104 | -- | -- | -- | 49 | 13 | 51 | 103 | 169 | -- | 91 | 629 | 474 | 391 | 134 |
| Poletimber | 8,625 | -- | -- | -- | 24 | 20 | 16 | 58 | 160 | 181 | 556 | 879 | 2,541 | 1,692 | 2,498 |
| Sapling & seedling | 2,827 | -- | 5 | 16 | 40 | 71 | 68 | 509 | 237 | 35 | 327 | 472 | 681 | 362 | 4 |
| All stands | 13,556 | -- | 5 | 16 | 113 | 104 | 135 | 670 | 566 | 216 | 974 | 1,980 | 3,696 | 2,445 | 2,636 |

(Table 52 continued on next page)

(Table 52 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 77 | -- | -- | -- | -- | -- | -- | -- | 77 | -- | -- | -- | -- | -- | -- |
| Poletimber | 891 | -- | -- | -- | 96 | 137 | 96 | 146 | 102 | 187 | 127 | -- | -- | -- | -- |
| Sapling & seedling | 260 | 6 | 8 | 12 | 48 | 73 | 24 | -- | 34 | 31 | 10 | -- | 14 | -- | -- |
| All stands | 1,228 | 6 | 8 | 12 | 144 | 210 | 120 | 146 | 213 | 218 | 137 | 0 | 14 | 0 | 0 |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 243 | -- | -- | -- | 21 | -- | -- | 99 | 56 | -- | -- | 67 | -- | -- | -- |
| Poletimber | 440 | -- | -- | -- | -- | -- | 35 | 166 | 64 | 77 | 26 | 72 | -- | -- | -- |
| Sapling & seedling | 54 | -- | -- | -- | -- | -- | -- | 54 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 737 | -- | -- | -- | 21 | -- | 35 | 319 | 120 | 77 | 26 | 139 | -- | -- | -- |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 2,116 | -- | -- | -- | -- | 53 | 17 | 52 | 376 | -- | 12 | 118 | 878 | 583 | 27 |
| Poletimber | 3,631 | -- | -- | -- | 43 | 230 | 57 | 332 | 83 | 71 | 631 | 484 | 1,276 | 424 | -- |
| Sapling & seedling | 1,445 | 12 | 14 | 120 | 42 | 92 | 378 | 271 | 97 | 78 | 150 | 131 | 60 | -- | -- |
| All stands | 7,192 | 12 | 14 | 120 | 85 | 375 | 452 | 655 | 556 | 149 | 793 | 733 | 2,214 | 1,007 | 27 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 18,553 | -- | 21 | -- | 97 | 59 | 41 | 704 | 2,395 | 1,785 | 2,095 | 5,103 | 4,145 | 1,691 | 417 |
| Poletimber | 23,941 | -- | 12 | 42 | 313 | 189 | 152 | 901 | 1,446 | 1,845 | 3,927 | 5,518 | 7,085 | 2,562 | -51 |
| Sapling & seedling | 4,108 | 9 | -11 | 149 | 330 | 598 | 363 | 600 | 656 | 881 | 174 | 252 | 106 | -- | -- |
| All stands | 46,601 | 9 | 22 | 191 | 740 | 846 | 556 | 2,205 | 4,497 | 4,511 | 6,196 | 10,873 | 11,336 | 4,253 | 366 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 2,303 | -- | -- | -- | 18 | 174 | 37 | 200 | 225 | 29 | 439 | 66 | 834 | 219 | 62 |
| Poletimber | 16,959 | -- | 56 | 35 | 269 | 300 | 630 | 1,067 | 1,434 | 1,916 | 2,719 | 2,841 | 2,635 | 2,575 | 482 |
| Sapling & seedling | 5,432 | 43 | 377 | 740 | 629 | 1,522 | 778 | 81 | 511 | 189 | 413 | 121 | 28 | -- | -- |
| All stands | 24,694 | 43 | 433 | 775 | 916 | 1,996 | 1,445 | 1,348 | 2,170 | 2,134 | 3,571 | 3,028 | 3,497 | 2,794 | 544 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 642 | -- | -- | -- | -- | -- | -- | 210 | -- | -- | -- | 53 | 379 | -- | -- |
| Poletimber | 3,603 | -- | -- | -- | -- | 357 | 300 | 283 | 408 | -- | 1,018 | 647 | 300 | 113 | 177 |
| Sapling & seedling | 478 | 4 | -- | 12 | 184 | 119 | -- | 40 | 81 | 25 | 13 | -- | -- | -- | -- |
| All stands | 4,723 | 4 | -- | 12 | 184 | 476 | 300 | 533 | 489 | 25 | 1,031 | 700 | 679 | 113 | 177 |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 43 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 43 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 43 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 43 | -- | -- | -- |
| Nonstocked | 185 | 90 | 41 | 2 | 6 | -- | -2 | -- | 48 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 33,100 | -- | 34 | 19 | 321 | 539 | 506 | 1,741 | 4,505 | 2,190 | 3,599 | 7,879 | 7,555 | 3,341 | 871 |
| Poletimber | 79,729 | 6 | 80 | 248 | 1,616 | 1,996 | 2,158 | 3,865 | 5,630 | 5,231 | 11,810 | 17,242 | 16,986 | 8,556 | 4,305 |
| Sapling & seedling | 19,221 | 101 | 868 | 1,264 | 2,114 | 2,905 | 2,061 | 2,512 | 1,844 | 1,584 | 1,482 | 1,214 | 906 | 362 | 4 |
| Nonstocked | 185 | 90 | 41 | 2 | 6 | -- | -2 | -- | 48 | -- | -- | -- | -- | -- | -- |
| All stands | 132,235 | 197 | 1,023 | 1,533 | 4,057 | 5,440 | 4,723 | 8,118 | 12,027 | 9,005 | 16,891 | 26,335 | 25,447 | 12,259 | 5,180 |

Table 53.--Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)1/

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 9,948 | -- | -- | -- | 53 | 765 | 947 | 1,140 | 1,862 | 696 | 1,433 | 3,052 | -- | -- | -- |
| Poletimber | 13,918 | -- | -- | 147 | 1,580 | 1,456 | 431 | 335 | 555 | 2,291 | 3,396 | 2,305 | 1,422 | -- | -- |
| Sapling & seedling | 798 | 21 | 151 | 17 | 546 | -- | -- | -- | 63 | -- | -- | -- | -- | -- | -- |
| All stands | 24,664 | 21 | 151 | 164 | 2,179 | 2,221 | 1,378 | 1,475 | 2,480 | 2,987 | 4,829 | 5,357 | 1,422 | -- | -- |
| Red pine | | | | | | | | | | | | | | |
| Sawtimber | 11,130 | -- | 74 | -- | 132 | 93 | 226 | 725 | 1,400 | -- | 1,416 | 2,085 | 3,348 | 1,363 | 268 |
| Poletimber | 8,436 | -- | -- | -- | -- | 103 | 693 | 413 | 1,661 | -- | -- | 3,402 | 67 | 1,393 | 704 |
| Sapling & seedling | 999 | -- | -- | 639 | -- | -- | 360 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 20,565 | -- | 74 | 639 | 132 | 196 | 1,279 | 1,138 | 3,061 | -- | 1,416 | 5,487 | 3,415 | 2,756 | 972 |
| White pine | | | | | | | | | | | | | | |
| Sawtimber | 9,307 | -- | -- | 410 | 147 | 139 | 331 | 444 | 2,277 | 166 | 1,877 | 2,188 | 573 | 755 | -- |
| Poletimber | 2,655 | -- | -- | -- | -- | 409 | 97 | 88 | -- | -- | -- | 2,061 | -- | -- | -- |
| Sapling & seedling | 439 | 65 | 123 | -- | 164 | -- | -- | 87 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 12,401 | 65 | 123 | 410 | 311 | 548 | 428 | 619 | 2,277 | 166 | 1,877 | 4,249 | 573 | 755 | -- |
| Balsam fir | | | | | | | | | | | | | | |
| Sawtimber | 12,988 | -- | -- | -- | -- | -- | 86 | -- | -- | 318 | 1,112 | 9,731 | 712 | -- | 1,029 |
| Poletimber | 12,334 | -- | -- | -- | 63 | 78 | -- | 32 | 1,782 | 751 | 2,589 | 2,605 | 2,552 | 609 | 1,273 |
| Sapling & seedling | 5,192 | -- | 28 | 1,010 | 299 | 2,280 | 462 | 298 | 96 | 676 | 9 | 34 | -- | -- | -- |
| All stands | 30,514 | -- | 28 | 1,010 | 362 | 2,358 | 548 | 330 | 1,878 | 1,745 | 3,710 | 12,370 | 3,264 | 609 | 2,302 |
| White spruce | | | | | | | | | | | | | | |
| Sawtimber | 2,632 | -- | -- | -- | 108 | -- | -- | -- | -- | -- | -- | 98 | 824 | 401 | 1,201 |
| Poletimber | 932 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 338 | 99 | 384 | -- | 111 |
| Sapling & seedling | 299 | -- | 66 | -- | 85 | -- | -- | 148 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 3,863 | -- | 66 | -- | 193 | -- | -- | 148 | -- | -- | 338 | 197 | 1,208 | 401 | 1,312 |
| Black spruce | | | | | | | | | | | | | | |
| Sawtimber | 381 | -- | -- | -- | -- | -- | 104 | -- | -21 | 147 | -- | 151 | -- | -- | -- |
| Poletimber | 6,021 | -- | -- | -- | 1,217 | 74 | 119 | 665 | 863 | 19 | 1,317 | 1,048 | 180 | 519 | -- |
| Sapling & seedling | 4,459 | -5 | 1,510 | -- | 141 | 549 | 646 | 327 | 514 | 551 | 152 | 26 | 48 | -- | -- |
| All stands | 10,861 | -5 | 1,510 | -- | 1,358 | 623 | 869 | 992 | 1,356 | 717 | 1,469 | 1,225 | 228 | 519 | -- |
| Northern white-cedar | | | | | | | | | | | | | | |
| Sawtimber | 14,572 | -- | -- | -- | 181 | 25 | 227 | 469 | 878 | -- | 795 | 2,867 | 2,405 | 3,338 | 3,387 |
| Poletimber | 17,076 | -- | -- | -- | 31 | 16 | -- | 75 | 16 | -817 | 1,444 | 3,000 | 3,540 | 4,328 | 5,443 |
| Sapling & seedling | 3,773 | -- | -- | 37 | 27 | 425 | 19 | 1,004 | 469 | 491 | 17 | 1,085 | -115 | 297 | 17 |
| All stands | 35,421 | -- | -- | 37 | 239 | 466 | 246 | 1,548 | 1,363 | -326 | 2,256 | 6,952 | 5,830 | 7,963 | 8,847 |

(Table 53 continued on next page)

(Table 53 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 467 | -- | -- | -- | -- | -- | -- | -- | 467 | -- | -- | -- | -- | -- | -- |
| Poletimber | 580 | -- | -- | -- | 29 | 61 | 60 | 150 | 86 | 115 | 79 | -- | -- | -- | -- |
| Sapling & seedling | 578 | -- | -- | 36 | 60 | -- | 68 | -- | -- | -- | -- | -- | 414 | -- | -- |
| All stands | 1,625 | -- | -- | 36 | 89 | 61 | 128 | 150 | 553 | 115 | 79 | 0 | 414 | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 650 | -- | -- | -- | 131 | -- | -- | 144 | 177 | -- | -- | 198 | -- | -- | -- |
| Poletimber | 1,556 | -- | -- | -- | -- | -- | 973 | 211 | 131 | 114 | 30 | 97 | -- | -- | -- |
| Sapling & seedling | 24 | -- | -- | -- | -- | -- | -- | 24 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,230 | -- | -- | -- | 131 | -- | 973 | 379 | 308 | 114 | 30 | 295 | -- | -- | -- |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 10,055 | -- | -- | -- | -- | 980 | 62 | 665 | 839 | -- | 39 | 576 | 3,242 | 3,530 | 122 |
| Poletimber | 7,471 | -- | -- | -- | 9 | 89 | 152 | -15 | 2,007 | -- | 1,643 | 61 | 2,910 | 615 | -- |
| Sapling & seedling | 1,352 | -- | 52 | 55 | 71 | 23 | 75 | 184 | 137 | -262 | 547 | -- | 470 | -- | -- |
| All stands | 18,878 | -- | 52 | 55 | 80 | 1,092 | 289 | 834 | 2,983 | -262 | 2,229 | 637 | 6,622 | 4,145 | 122 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 100,955 | -- | 465 | -- | 413 | 1,265 | 161 | 3,027 | 10,125 | 7,376 | 19,091 | 25,381 | 23,968 | 6,651 | 3,032 |
| Poletimber | 81,419 | -- | 15 | 18 | 128 | 807 | 604 | 804 | 6,918 | 8,768 | 10,264 | 16,532 | 26,254 | 9,997 | 310 |
| Sapling & seedling | 8,263 | 25 | -- | 46 | 732 | 960 | 503 | 2,619 | 807 | 1,149 | 269 | 1,083 | 70 | -- | -- |
| All stands | 190,637 | 25 | 480 | 64 | 1,273 | 3,032 | 1,268 | 6,450 | 17,850 | 17,293 | 29,624 | 42,996 | 50,292 | 16,648 | 3,342 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 18,317 | -- | -- | 59 | 47 | 2,727 | 86 | 906 | 1,218 | 645 | 2,047 | 181 | 6,046 | 1,762 | 2,593 |
| Poletimber | 56,998 | -- | 8 | 468 | 67 | 713 | 436 | 4,310 | 3,089 | 10,511 | 11,979 | 8,680 | 9,357 | 5,609 | 1,771 |
| Sapling & seedling | 7,749 | 106 | 350 | 767 | 1,827 | 2,448 | 450 | 222 | 229 | 678 | 57 | 615 | -- | -- | -- |
| All stands | 83,064 | 106 | 358 | 1,294 | 1,941 | 5,888 | 972 | 5,438 | 4,536 | 11,834 | 14,083 | 9,476 | 15,403 | 7,371 | 4,364 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 2,375 | -- | -- | -- | -- | -- | -- | 247 | -- | -- | -- | 755 | 1,373 | -- | -- |
| Poletimber | 9,576 | -- | -- | -- | -- | 3,286 | 1,436 | 75 | 1,573 | -- | 1,006 | 412 | 1,526 | 169 | 93 |
| Sapling & seedling | 446 | 29 | -- | 23 | -- | 285 | -- | 59 | -- | 50 | -- | -- | -- | -- | -- |
| All stands | 12,397 | 29 | -- | 23 | -- | 3,571 | 1,436 | 381 | 1,573 | 50 | 1,006 | 1,167 | 2,899 | 169 | 93 |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 85 | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 85 | -- | -- | -- |
| Nonstocked | 161 | 32 | 153 | 38 | 5 | -- | -41 | -- | -26 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 193,777 | -- | 539 | 469 | 1,212 | 5,994 | 2,230 | 7,767 | 19,222 | 9,348 | 27,810 | 47,263 | 42,491 | 17,800 | 11,632 |
| Poletimber | 219,057 | -- | 23 | 633 | 3,124 | 7,092 | 5,001 | 7,143 | 18,681 | 21,752 | 34,085 | 40,387 | 48,192 | 23,239 | 9,705 |
| Spling & seedling | 34,371 | 241 | 2,280 | 2,630 | 3,952 | 6,970 | 2,583 | 4,972 | 2,315 | 3,333 | 1,051 | 2,843 | 887 | 297 | 17 |
| Nonstocked | 161 | 32 | 153 | 38 | 5 | -- | -41 | -- | -26 | -- | -- | -- | -- | -- | -- |
| All stands | 447,366 | 273 | 2,995 | 3,770 | 8,293 | 20,056 | 9,773 | 19,882 | 40,192 | 34,433 | 62,946 | 90,493 | 91,570 | 41,336 | 21,354 |

[1] International 1/4-inch rule.

Table 54.--Timber removals[1] from growing stock on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All counties | County<br>Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 1,691 | 257 | 141 | 173 | 428 | 69 | 289 | 334 |
| Red pine | 1,422 | 156 | 149 | 316 | 256 | 70 | 106 | 369 |
| Jack pine | 5,230 | 410 | 976 | 484 | 1,997 | 352 | 106 | 905 |
| White spruce | 997 | 74 | 130 | 193 | 125 | 213 | 201 | 61 |
| Black spruce | 1,432 | 43 | 238 | 201 | 272 | 198 | 327 | 153 |
| Balsam fir | 4,273 | 298 | 389 | 1,072 | 461 | 474 | 1260 | 319 |
| Hemlock | 2,554 | 691 | 117 | 337 | 502 | 89 | 563 | 255 |
| Tamarack | 151 | 5 | 21 | 24 | 17 | 5 | 63 | 16 |
| Northern white-cedar | 3,396 | 185 | 207 | 864 | 143 | 234 | 1484 | 279 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 21,146 | 2,119 | 2,368 | 3,664 | 4,201 | 1,704 | 4,399 | 2,691 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 17 | -- | -- | 3 | -- | -- | 14 | -- |
| Select red oaks | 151 | 15 | 22 | 22 | 44 | 13 | 23 | 12 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 1,616 | 495 | 153 | 226 | 278 | 82 | 139 | 243 |
| Hard maple | 9,179 | 2,958 | 573 | 813 | 1,576 | 739 | 1210 | 1310 |
| Soft maple | 3,189 | 646 | 138 | 615 | 341 | 203 | 577 | 669 |
| Beech | 3,444 | 1,241 | 281 | 96 | 885 | 189 | 61 | 691 |
| Ash | 313 | 24 | 35 | 43 | 9 | 33 | 155 | 14 |
| Balsam poplar | 926 | 85 | 43 | 269 | 47 | 118 | 188 | 176 |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,509 | 66 | 117 | 408 | 55 | 217 | 433 | 213 |
| Quaking aspen | 8,658 | 273 | 914 | 2,383 | 384 | 869 | 2936 | 899 |
| Basswood | 482 | 56 | 91 | 51 | 18 | 66 | 176 | 24 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,289 | 252 | 64 | 257 | 89 | 123 | 369 | 135 |
| Paper birch | 2,471 | 227 | 180 | 649 | 157 | 212 | 618 | 428 |
| Other hardwoods[2] | 108 | 38 | 4 | 22 | 17 | 1 | 8 | 18 |
| Total | 33,352 | 6,376 | 2,615 | 5,857 | 3,900 | 2,865 | 6,907 | 4,832 |
| All species | 54,498 | 8,495 | 4,983 | 9,521 | 8,101 | 4,569 | 11,306 | 7,523 |

[1] Removals in 1979 are trend-level removals.
[2] Includes black cherry.

Table 55.--Timber removals[1] from sawtimber on commercial forest land by species group and county, Eastern Upper Peninsula, Michigan, 1980

(In thousand board feet)[2]

| Species group | All counties | County | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Alger | Chippewa | Delta | Luce | Mackinac | Menominee | Schoolcraft |
| SOFTWOODS | | | | | | | | |
| White pine | 7,518 | 1,161 | 564 | 585 | 2,021 | 238 | 1,402 | 1,547 |
| Red pine | 5,571 | 501 | 601 | 922 | 1,094 | 250 | 428 | 1,775 |
| Jack pine | 11,894 | 887 | 2,112 | 1,044 | 4,763 | 764 | 230 | 2,094 |
| White spruce | 4,617 | 257 | 615 | 794 | 631 | 900 | 1086 | 334 |
| Black spruce | 1,761 | 68 | 363 | 204 | 425 | 260 | 235 | 206 |
| Balsam fir | 10,525 | 741 | 1,010 | 2,628 | 1,191 | 1,263 | 2,889 | 803 |
| Hemlock | 9,043 | 2,592 | 449 | 992 | 1,628 | 319 | 2,234 | 829 |
| Tamarack | 426 | 14 | 55 | 58 | 38 | 10 | 215 | 36 |
| Northern white-cedar | 7,071 | 364 | 477 | 1,837 | 264 | 503 | 3,102 | 524 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 58,426 | 6,585 | 6,246 | 9,064 | 12,055 | 4,507 | 11,821 | 8,148 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 8 | -- | -- | 1 | -- | -- | 7 | -- |
| Select red oaks | 611 | 53 | 118 | 40 | 224 | 68 | 74 | 34 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 7,114 | 2,278 | 545 | 720 | 1,482 | 295 | 514 | 1,280 |
| Hard maple | 42,700 | 14,740 | 2,075 | 3,017 | 8,042 | 3,145 | 4,882 | 6,799 |
| Soft maple | 9,039 | 2,372 | 358 | 1,061 | 1,339 | 724 | 1,214 | 1,971 |
| Beech | 17,080 | 6,488 | 1,335 | 407 | 4,500 | 767 | 271 | 3,312 |
| Ash | 1,024 | 102 | 187 | 110 | 31 | 155 | 391 | 48 |
| Balsam poplar | 1,645 | 129 | 72 | 453 | 72 | 268 | 391 | 260 |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 2,868 | 122 | 356 | 852 | 121 | 333 | 726 | 358 |
| Quaking aspen | 18,022 | 511 | 2,650 | 3,879 | 1,094 | 2,089 | 6,084 | 1,715 |
| Basswood | 2,404 | 267 | 473 | 225 | 94 | 338 | 890 | 117 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 4,917 | 1,069 | 276 | 723 | 374 | 579 | 1,392 | 504 |
| Paper birch | 6,071 | 464 | 503 | 1,436 | 357 | 576 | 1,679 | 1,056 |
| Other hardwoods[3] | 377 | 168 | 7 | 52 | 72 | 4 | 20 | 54 |
| Total | 113,880 | 28,763 | 8,955 | 12,976 | 17,802 | 9,341 | 18,535 | 17,508 |
| All species | 172,306 | 35,348 | 15,201 | 22,040 | 29,857 | 13,848 | 30,356 | 25,656 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes black cherry.

Table 56.--Timber removals[1] from growing stock and sawtimber on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1965 and 1979

| Species group | Growing stock | | Sawtimber | |
|---|---|---|---|---|
| | [2]1965 | 1979 | [2]1965 | 1979 |
| | Thousand cubic feet | | [3]Thousand board feet | |
| SOFTWOODS | | | | |
| White pine | 874 | 1,691 | 3,867 | 7,518 |
| Red pine | 883 | 1,422 | 3,482 | 5,571 |
| Jack pine | 4,539 | 5,230 | 12,417 | 11,894 |
| White spruce | 1,055 | 997 | 5,274 | 4,617 |
| Black spruce | 1,602 | 1,432 | 4,235 | 1,761 |
| Balsam fir | 4,145 | 4,273 | 13,786 | 10,525 |
| Hemlock | 2,882 | 2,554 | 15,649 | 9,043 |
| Tamarack | 256 | 151 | 954 | 426 |
| Northern white-cedar | 5,667 | 3,396 | 7,418 | 7,071 |
| Other softwoods | -- | -- | -- | -- |
| Total | 21,903 | 21,146 | 67,082 | 58,426 |
| HARDWOODS | | | | |
| Select white oaks | 2 | 17 | 20 | 8 |
| Select red oaks | 92 | 151 | 517 | 611 |
| Other red oaks | 2 | -- | 5 | -- |
| Hickory | -- | -- | -- | -- |
| Yellow birch | 2,184 | 1,616 | 12,217 | 7,114 |
| Hard maple | 6,237 | 9,179 | 33,227 | 42,700 |
| Soft maple | 614 | 3,189 | 3,384 | 9,039 |
| Beech | 2,465 | 3,444 | 15,463 | 17,080 |
| Ash | 95 | 313 | 516 | 1,024 |
| Balsam poplar | 884 | 926 | 5,154 | 1,645 |
| Cottonwood | -- | -- | -- | -- |
| Bigtooth aspen | 2,333 | 1,509 | 8,961 | 2,868 |
| Quaking aspen | 9,596 | 8,658 | 20,132 | 18,022 |
| Basswood | 199 | 482 | 1,191 | 2,404 |
| Yellow-poplar | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- |
| Elm | 369 | 1,289 | 2,033 | 4,917 |
| Paper birch | 979 | 2,471 | 4,941 | 6,071 |
| Other hardwoods[4] | 150 | 108 | 858 | 377 |
| Total | 26,201 | 33,352 | 108,619 | 113,880 |
| All species | 48,104 | 54,498 | 175,701 | 172,306 |

[1] Removals in 1979 are trend-level removals.

[2] Figures have been adjusted from those published after the 1966 survey to conform to 1980 volumes because of changes in survey definitions and procedures.

[3] International 1/4-inch rule.

[4] Includes black cherry.

Table 57.--Timber removals[1] from growing stock and sawtimber on commercial forest land by item and species category, Eastern Upper Peninsula, Michigan, 1979

| Item | Growing stock | | | | | | Sawtimber | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods |
| | - - - - - - - - - Thousand cubic feet - - - - - - - - - | | | | | | - - - - - - - - - [2]Thousand board feet - - - - - - - - - - | | | | | |
| ROUNDWOOD PRODUCTS | | | | | | | | | | | | |
| Pulpwood | 26,753 | 5,923 | 7,117 | 7,623 | 860 | 5,230 | 56,240 | 13,569 | 18,936 | 12,797 | 2,362 | 8,576 |
| Saw logs | 13,234 | 1,792 | 1,165 | 1,075 | 4,585 | 4,617 | 75,902 | 10,406 | 6,327 | 5,241 | 27,846 | 26,082 |
| Fuelwood | 472 | [4] | 9 | 40 | 136 | 287 | 1,593 | 15 | 46 | 128 | 446 | 958 |
| Posts | 1,868 | -- | 1,868 | -- | -- | -- | 1,924 | -- | 1,924 | -- | -- | -- |
| Veneer logs | 1,064 | 4 | -- | 8 | 489 | 563 | 7,758 | 27 | -- | 55 | 3,575 | 4,101 |
| Poles | 39 | 39 | -- | -- | -- | -- | 157 | 157 | -- | -- | -- | -- |
| Other[3] | 1,062 | 7 | 291 | 675 | -- | 89 | 2,241 | 29 | 942 | 1,128 | -- | 142 |
| Subtotal | 44,492 | 7,765 | 10,450 | 9,421 | 6,070 | 10,786 | 145,815 | 24,203 | 28,175 | 19,349 | 34,229 | 39,859 |
| LOGGING RESIDUE | 3,312 | 280 | 702 | 422 | 803 | 1,105 | 6,692 | 255 | 1,736 | 182 | 2,238 | 2,281 |
| OTHER REMOVALS | 6,694 | 298 | 1,651 | 324 | 2,306 | 2,115 | 19,799 | 525 | 3,532 | 1,359 | 6,233 | 8,150 |
| TOTAL | 54,498 | 8,343 | 12,803 | 10,167 | 9,179 | 14,006 | 172,306 | 24,983 | 33,443 | 20,890 | 42,700 | 50,290 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes charcoal wood, shingle bolts, cabin logs, particleboard bolts, piling, etc.

[4] Less than 500 cubic feet.

## Table 58.--Net annual growth and removals[1] of growing stock on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 4,426 | 1,691 |
| Red pine | 6,437 | 1,422 |
| Jack pine | 7,527 | 5,230 |
| White spruce | 7,252 | 997 |
| Black spruce | 6,570 | 1,432 |
| Balsam fir | 6,263 | 4,273 |
| Hemlock | 3,090 | 2,554 |
| Tamarack | 849 | 151 |
| Northern white-cedar | 17,080 | 3,396 |
| Other softwoods | 51 | -- |
| Total | 59,545 | 21,146 |
| HARDWOODS | | |
| Select white oaks | 12 | 17 |
| Select red oaks | 816 | 151 |
| Other red oaks | -- | -- |
| Hickory | -- | -- |
| Yellow birch | 1,621 | 1,616 |
| Hard maple | 18,589 | 9,179 |
| Soft maple | 20,833 | 3,189 |
| Beech | 4,169 | 3,444 |
| Ash | 6,172 | 313 |
| Balsam poplar | 2,093 | 926 |
| Cottonwood | 15 | -- |
| Bigtooth aspen | 1,956 | 1,509 |
| Quaking aspen | 10,834 | 8,658 |
| Basswood | 2,020 | 482 |
| Yellow-poplar | -- | -- |
| Black walnut | -- | -- |
| Butternut | -- | -- |
| Elm | -5,230 | 1,289 |
| Paper birch | 6,791 | 2,471 |
| Other hardwoods[2] | 1,999 | 108 |
| Total | 72,690 | 33,352 |
| All species | 132,235 | 54,498 |

[1] Removals in 1979 are trend-level removals.

[2] Includes black cherry.

Table 59.--Net annual growth and removals[1] of sawtimber on commercial forest land by species group, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[2]

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 25,973 | 7,518 |
| Red pine | 23,613 | 5,571 |
| Jack pine | 23,253 | 11,894 |
| White spruce | 33,520 | 4,617 |
| Black spruce | 5,452 | 1,761 |
| Balsam fir | 15,119 | 10,525 |
| Hemlock | 19,709 | 9,043 |
| Tamarack | 3,203 | 426 |
| Northern white-cedar | 40,382 | 7,071 |
| Other softwoods | 387 | -- |
| Total | 190,611 | 58,426 |
| HARDWOODS | | |
| Select white oaks | 22 | 8 |
| Select red oaks | 2,758 | 611 |
| Other red oaks | -- | -- |
| Hickory | -- | -- |
| Yellow birch | 8,178 | 7,114 |
| Hard maple | 65,882 | 42,700 |
| Soft maple | 55,522 | 9,039 |
| Beech | 18,805 | 17,080 |
| Ash | 12,098 | 1,024 |
| Balsam poplar | 8,986 | 1,645 |
| Cottonwood | 77 | -- |
| Bigtooth aspen | 4,336 | 2,868 |
| Quaking aspen | 58,263 | 18,022 |
| Basswood | 8,150 | 2,404 |
| Yellow-poplar | -- | -- |
| Black walnut | -- | -- |
| Butternut | -- | -- |
| Elm | -12,244 | 4,917 |
| Paper birch | 17,076 | 6,071 |
| Other hardwoods[3] | 8,846 | 377 |
| Total | 256,755 | 113,880 |
| All species | 447,366 | 172,306 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes black cherry.

## Table 60.--Net annual growth and removals[1] of growing stock on commercial forest land by ownership class and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Ownership class | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 24,645 | 14,422 | 10,223 | 7,696 | 4,055 | 3,641 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 471 | 348 | 123 | 126 | 100 | 26 |
| Indian | 99 | 17 | 82 | 47 | 1 | 46 |
| State | 31,419 | 16,772 | 14,647 | 7,463 | 3,998 | 3,465 |
| County and municipal | 329 | 229 | 100 | 8 | 3 | 5 |
| Forest industry | 23,765 | 9,023 | 14,742 | 11,179 | 2,412 | 8,767 |
| Farmer | 15,241 | 5,801 | 9,440 | [2] 27,979 | [2] 10,577 | [2] 17,402 |
| Misc. private-corp. | 8,932 | 3,800 | 5,132 | -- | -- | -- |
| Misc. private-indiv. | 27,334 | 9,133 | 18,201 | -- | -- | -- |
| All owners | 132,235 | 59,545 | 72,690 | 54,498 | 21,146 | 33,352 |

[1] Removals in 1979 are trend-level removals.
[2] Includes miscellaneous private-corporation and miscellaneous private-indivdual.

## Table 61.--Net annual growth and removals[1] of sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[2]

| Ownership class | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 78,630 | 40,875 | 37,755 | 18,640 | 10,556 | 8,084 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 3,232 | 3,101 | 131 | 297 | 240 | 57 |
| Indian | 560 | 438 | 122 | 108 | 1 | 107 |
| State | 107,352 | 66,108 | 41,244 | 21,111 | 10,434 | 10,677 |
| County and municipal | 249 | 28 | 221 | 23 | 6 | 17 |
| Forest industry | 84,609 | 28,699 | 55,910 | 46,900 | 8,454 | 38,446 |
| Farmer | 53,512 | 15,038 | 38,474 | [3] 85,227 | [3] 28,735 | [3] 56,492 |
| Misc. private-corp. | 24,259 | 12,203 | 12,056 | -- | -- | -- |
| Misc. private-indiv. | 94,963 | 24,121 | 70,842 | -- | -- | -- |
| All owners | 447,366 | 190,611 | 256,755 | 172,306 | 58,426 | 113,880 |

[1] Removals in 1979 are trend-level removals.
[2] International 1/4-inch rule.
[3] Includes miscellaneous private-corporation and miscellaneous private-individual.

## Table 62.--Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1965[1] and 1979

(In million cubic feet)

| Species | 1965[1] | 1979 |
|---|---|---|
| Softwoods | 13.0 | 16.8 |
| Hardwoods | 19.5 | 24.0 |
| Total | 32.5 | 40.8 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 63.--Annual mortality of growing stock on commercial forest land by species group and cause, Eastern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All causes | Cause |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 293 | -- | 59 | 9 | -- | 45 | 7 | 173 |
| Red pine | 6 | -- | -- | -- | -- | 2 | -- | 4 |
| Jack pine | 593 | -- | 77 | -- | 34 | 41 | -- | 441 |
| White spruce | 583 | 53 | 65 | -- | -- | 112 | -- | 353 |
| Black spruce | 1,391 | 407 | 167 | 18 | -- | 72 | -- | 727 |
| Balsam fir | 10,578 | 2,771 | 1,166 | -- | -- | 1,368 | 25 | 5,248 |
| Hemlock | 200 | 12 | 48 | -- | -- | 26 | 3 | 111 |
| Tamarack | 1,476 | 108 | 366 | 86 | 142 | 60 | -- | 714 |
| Northern white-cedar | 1,702 | 15 | 330 | -- | -- | 406 | -- | 951 |
| Other softwoods | 3 | -- | -- | -- | -- | -- | -- | 3 |
| Total | 16,825 | 3,366 | 2,278 | 113 | 176 | 2,132 | 35 | 8,725 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 1 | -- | -- | -- | -- | -- | -- | 1 |
| Select red oaks | 101 | -- | 66 | -- | 1 | 6 | -- | 28 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 791 | -- | 362 | -- | -- | -- | -- | 429 |
| Hard maple | 2,534 | -- | 544 | -- | -- | 676 | -- | 1,314 |
| Soft maple | 914 | -- | 155 | -- | 36 | 233 | -- | 490 |
| Beech | 573 | -- | -- | -- | -- | 573 | -- | -- |
| Ash | 434 | -- | 129 | -- | -- | 48 | -- | 257 |
| Balsam poplar | 1,985 | -- | 579 | -- | -- | 101 | -- | 1,305 |
| Cottonwood | 1 | -- | -- | -- | -- | -- | -- | 1 |
| Bigtooth aspen | 898 | -- | 337 | -- | -- | 192 | -- | 369 |
| Quaking aspen | 6,930 | -- | 3,191 | -- | 257 | 824 | -- | 2,658 |
| Basswood | 166 | -- | 68 | -- | -- | -- | -- | 98 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 114 | -- | -- | -- | -- | 29 | -- | 85 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 6,961 | 19 | 6,359 | -- | -- | 19 | -- | 564 |
| Paper birch | 1,563 | -- | 579 | -- | -- | 121 | -- | 863 |
| Other hardwoods | 2 | -- | -- | -- | -- | -- | -- | 2 |
| Total | 23,968 | 19 | 12,369 | -- | 294 | 2,822 | -- | 8,464 |
| All species | 40,793 | 3,385 | 14,647 | 113 | 470 | 4,954 | 35 | 17,189 |

Table 64.--Annual mortality of sawtimber on commercial forest land by species group and cause, Eastern Upper Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Species group | All causes | Cause |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 1,373 | -- | 279 | -- | -- | 307 | -- | 787 |
| Red pine | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 852 | -- | 165 | -- | -- | -- | -- | 687 |
| White spruce | 2,327 | 364 | 293 | -- | -- | 610 | -- | 1,060 |
| Black spruce | 3,192 | 1,513 | 188 | -- | -- | -- | -- | 1,491 |
| Balsam fir | 15,614 | 2,688 | 1,683 | -- | -- | 3,122 | -- | 8,121 |
| Hemlock | 953 | 62 | 246 | -- | -- | 126 | -- | 519 |
| Tamarack | 1,625 | 197 | 275 | -- | -- | -- | -- | 1,153 |
| Northern white-cedar | 3,930 | 61 | 668 | -- | -- | 1,088 | -- | 2,113 |
| Other softwoods | 3 | -- | -- | -- | -- | -- | -- | 3 |
| Total | 29,869 | 4,885 | 3,797 | -- | -- | 5,253 | -- | 15,934 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 2 | -- | -- | -- | -- | -- | -- | 2 |
| Select red oaks | 305 | -- | 222 | -- | 4 | 21 | -- | 58 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 3,022 | -- | 1,732 | -- | -- | -- | -- | 1,290 |
| Hard maple | 6,083 | -- | 1,509 | -- | -- | 1,714 | -- | 2,860 |
| Soft maple | 2,126 | -- | 569 | -- | -- | 595 | -- | 962 |
| Beech | 2,458 | -- | -- | -- | -- | 2,458 | -- | -- |
| Ash | 506 | -- | 166 | -- | -- | -- | -- | 340 |
| Balsam poplar | 5,920 | -- | 1,922 | -- | -- | 720 | -- | 3,278 |
| Cottonwood | 6 | -- | -- | -- | -- | -- | -- | 6 |
| Bigtooth aspen | 1,498 | -- | 455 | -- | -- | 499 | -- | 544 |
| Quaking aspen | 9,226 | -- | 3,453 | -- | 1,040 | 1,961 | -- | 2,772 |
| Basswood | 448 | -- | 264 | -- | -- | -- | -- | 184 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 163 | -- | -- | -- | -- | 163 | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 19,191 | -- | 18,152 | -- | -- | -- | -- | 1,039 |
| Paper birch | 1,835 | -- | 921 | -- | -- | 208 | -- | 706 |
| Other hardwoods | 2 | -- | -- | -- | -- | -- | -- | 2 |
| Total | 52,791 | -- | 29,365 | -- | 1,044 | 8,339 | -- | 14,043 |
| All species | 82,660 | 4,885 | 33,162 | -- | 1,044 | 13,592 | -- | 29,977 |

[1] International 1/4-inch rule.

Table 65.--Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1979

| Ownership class | Growing stock |  |  | Sawtimber |  |  |
|---|---|---|---|---|---|---|
|  | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
|  | - - - - Thousand cubic feet- - - - |  |  | - - - [1]Thousand board feet- - - - - |  |  |
| National Forest | 6,288 | 2,096 | 4,192 | 10,024 | 5,175 | 4,849 |
| Bureau of Land Management | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 54 | 39 | 15 | 104 | 84 | 20 |
| Indian | 187 | 5 | 182 | 675 | 1 | 674 |
| State | 10,242 | 4,933 | 5,309 | 21,576 | 9,301 | 12,275 |
| County and municipal | 18 | 9 | 9 | 22 | 2 | 20 |
| Forest industry | 6,181 | 2,948 | 3,233 | 14,315 | 5,198 | 9,117 |
| Farmer | 7,207 | 2,193 | 5,014 | 15,029 | 2,555 | 12,474 |
| Misc. private-corp. | 2,170 | 1,066 | 1,104 | 4,418 | 2,088 | 2,330 |
| Misc. private-indiv. | 8,446 | 3,536 | 4,910 | 16,497 | 5,465 | 11,032 |
| All owners | 40,793 | 16,825 | 23,968 | 82,660 | 29,869 | 52,791 |

[1] International 1/4-inch rule.

Table 66.--Output of timber products by source of material and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1978

| Product | Standard units | Total | | Roundwood products | | | | Plant byproducts | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Growing stock | | Nongrowing stock | | | |
| | | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet |
| PULPWOOD | | | | | | | | | |
| Softwood | [1] Standard cords | 190,029 | 14,994 | 165,273 | 13,040 | 17,326 | 1,367 | 7,430 | 587 |
| Hardwood | | 228,780 | 18,052 | 173,808 | 13,713 | 30,343 | 2,394 | 24,629 | 1,945 |
| Total | | 418,809 | 33,046 | 339,081 | 26,753 | 47,669 | 3,761 | 32,059 | 2,532 |
| SAW LOGS | | | | | | | | | |
| Softwood | [2] Thousand board feet | 17,610 | 3,059 | 17,023 | 2,957 | 587 | 102 | -- | -- |
| Hardwood | | 63,002 | 10,576 | 61,221 | 10,277 | 1,781 | 299 | -- | -- |
| Total | | 80,612 | 13,635 | 78,244 | 13,234 | 2,368 | 401 | -- | -- |
| VENEER LOGS | | | | | | | | | |
| Softwood | [2] Thousand board feet | 27 | 4 | 27 | 4 | -- | -- | -- | -- |
| Hardwood | | 7,731 | 1,060 | 7,731 | 1,060 | -- | -- | -- | -- |
| Total | | 7,758 | 1,064 | 7,758 | 1,064 | -- | -- | -- | -- |
| FUELWOOD | | | | | | | | | |
| Softwood | [1] Standard cords | 5,778 | 380 | 194 | 9 | 841 | 39 | 4,743 | 332 |
| Hardwood | | 47,410 | 3,305 | 6,667 | 463 | 18,029 | 1,252 | 22,714 | 1,590 |
| Total | | 53,188 | 3,685 | 6,861 | 472 | 18,870 | 1,291 | 27,457 | 1,922 |
| POSTS | | | | | | | | | |
| Softwood | Thousand pieces | 1,999 | 2,056 | 1,816 | 1,868 | 183 | 188 | -- | -- |
| Hardwood | | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | | 1,999 | 2,056 | 1,816 | 1,868 | 183 | 188 | -- | -- |
| POLES | | | | | | | | | |
| Softwood | Pieces | 4,614 | 39 | 4,614 | 39 | -- | -- | -- | -- |
| Hardwood | | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | | 4,614 | 39 | 4,614 | 39 | -- | -- | -- | -- |
| OTHER[3] | | | | | | | | | |
| Softwood | Thousand cubic feet | 439 | 439 | 298 | 298 | -- | -- | 141 | 141 |
| Hardwood | | 2,231 | 2,231 | 764 | 764 | 61 | 61 | 1,406 | 1,406 |
| Total | | 2,670 | 2,670 | 1,062 | 1,062 | 61 | 61 | 1,547 | 1,547 |
| ALL PRODUCTS | | | | | | | | | |
| Softwood | Thousand cubic feet | -- | 20,971 | -- | 18,215 | -- | 1,696 | -- | 1,060 |
| Hardwood | | -- | 35,224 | -- | 26,277 | -- | 4,006 | -- | 4,941 |
| Total | | -- | 56,195 | -- | 44,492 | -- | 5,702 | -- | 6,001 |

[1] Rough-wood, 128 cubic foot basis.

[2] International 1/4-inch rule.

[3] Other (industrial production) includes cabin logs, charcoal wood, particleboard bolts, shingle bolts, pilings, etc.

Table 67.--Output of roundwood products by source and softwoods and hardwoods, Eastern Upper Peninsula, Michigan, 1978

(In thousand cubic feet)

| Product and species group | All sources | Growing-stock trees | | | Rough and rotten trees | Salvable dead trees | Other sources |
|---|---|---|---|---|---|---|---|
| | | Total | Sawtimber | Poletimber | | | |
| INDUSTRIAL PRODUCTS | | | | | | | |
| Saw logs | | | | | | | |
| Softwood | 3,059 | 2,957 | 2,910 | 47 | 1 | 41 | 60 |
| Hardwood | 10,576 | 10,277 | 9,900 | 377 | 91 | -- | 208 |
| Subtotal | 13,635 | 13,234 | 12,810 | 424 | 92 | 41 | 268 |
| Veneer logs and bolts | | | | | | | |
| Softwood | 4 | 4 | 4 | -- | -- | -- | -- |
| Hardwood | 1,060 | 1,060 | 1,060 | -- | -- | -- | -- |
| Subtotal | 1,064 | 1,064 | 1,064 | -- | -- | -- | -- |
| Pulpwood | | | | | | | |
| Softwood | 14,407 | 13,040 | 8,495 | 4,545 | 227 | 329 | 811 |
| Hardwood | 16,107 | 13,713 | 6,054 | 7,659 | 1,342 | 146 | 906 |
| Subtotal | 30,514 | 26,753 | 14,549 | 12,204 | 1,569 | 475 | 1,717 |
| Cooperage | | | | | | | |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Piling | | | | | | | |
| Softwood | 5 | 5 | 5 | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 5 | 5 | 5 | -- | -- | -- | -- |
| Poles | | | | | | | |
| Softwood | 39 | 39 | 32 | 7 | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 39 | 39 | 32 | 7 | -- | -- | -- |
| Mine timbers (Round) | | | | | | | |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Posts (Round and split) | | | | | | | |
| Softwood | 2,056 | 1,868 | 498 | 1,370 | 23 | -- | 165 |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 2,056 | 1,868 | 498 | 1,370 | 23 | -- | 165 |
| Other | | | | | | | |
| Softwood | 293 | 293 | 163 | 130 | -- | -- | -- |
| Hardwood | 825 | 764 | 322 | 442 | 33 | 6 | 22 |
| Subtotal | 1,118 | 1,057 | 485 | 572 | 33 | 6 | 22 |
| All industrial products | | | | | | | |
| Softwood | 19,863 | 18,206 | 12,107 | 6,099 | 251 | 370 | 1,036 |
| Hardwood | 28,568 | 25,814 | 17,336 | 8,478 | 1,466 | 152 | 1,136 |
| Total | 48,431 | 44,020 | 29,443 | 14,577 | 1,717 | 522 | 2,172 |
| FUELWOOD | | | | | | | |
| Softwood | 48 | 9 | 6 | 3 | 1 | -- | 38 |
| Hardwood | 1,715 | 463 | 268 | 195 | 94 | -- | 1,158 |
| Total | 1,763 | 472 | 274 | 198 | 95 | -- | 1,196 |
| ALL PRODUCTS | | | | | | | |
| Softwood | 19,911 | 18,215 | 12,113 | 6,102 | 252 | 370 | 1,074 |
| Hardwood | 30,283 | 26,277 | 17,604 | 8,673 | 1,560 | 152 | 2,294 |
| Total | 50,194 | 44,492 | 29,717 | 14,775 | 1,812 | 522 | 3,368 |

## Table 68.--Timber products from roundwood by species group and product, Eastern Upper Peninsula, Michigan, 1978

| Species group | All Products | Pulpwood | | Saw logs | | Veneer logs | |
|---|---|---|---|---|---|---|---|
| | [1]Thousand cubic feet | Cords | [1]Thousand cubic feet | [2]Thousand board feet | [1]Thousand cubic feet | [2]Thousand board feet | [1]Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 1,524 | 5,284 | 414 | 6,610 | 1,109 | -- | -- |
| Red pine | 1,448 | 11,101 | 876 | 3,150 | 526 | 27 | 4 |
| Jack pine | 5,667 | 69,015 | 5,450 | 1,108 | 206 | -- | -- |
| White spruce | 967 | 10,829 | 854 | 327 | 61 | -- | -- |
| Black spruce | 1,224 | 13,695 | 1,081 | 414 | 77 | -- | -- |
| Balsam fir | 4,024 | 43,827 | 3,459 | 489 | 93 | -- | -- |
| Hemlock | 2,294 | 23,843 | 1,883 | 2,411 | 404 | -- | -- |
| Tamarack | 124 | 1,217 | 93 | 152 | 30 | -- | -- |
| Northern white-cedar | 2,639 | 3,788 | 297 | 2,949 | 553 | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 19,911 | 182,599 | 14,407 | 17,610 | 3,059 | 27 | 4 |
| HARDWOODS | | | | | | | |
| Select white oaks | 20 | 252 | 20 | -- | -- | -- | -- |
| Select red oaks | 126 | 637 | 47 | 286 | 49 | 212 | 29 |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 987 | 3,879 | 305 | 2,042 | 342 | 2,071 | 284 |
| Hard maple | 7,150 | 17,894 | 1,411 | 29,262 | 4,748 | 3,575 | 489 |
| Soft maple | 3,284 | 26,210 | 2,068 | 5,576 | 979 | 37 | 5 |
| Beech | 2,539 | 7,588 | 600 | 10,006 | 1,684 | 796 | 109 |
| Ash | 320 | 2,268 | 178 | 696 | 120 | 19 | 3 |
| Balsam poplar | 981 | 11,738 | 924 | 328 | 57 | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,531 | 15,635 | 1,235 | 943 | 165 | 8 | 1 |
| Quaking aspen | 8,599 | 87,722 | 6,930 | 5,293 | 929 | 47 | 7 |
| Basswood | 415 | 236 | 17 | 2,174 | 383 | 103 | 15 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,454 | 5,621 | 446 | 3,875 | 680 | 9 | 1 |
| Paper birch | 2,788 | 23,867 | 1,881 | 2,256 | 396 | 854 | 117 |
| Other hardwoods[3] | 89 | 604 | 45 | 265 | 44 | -- | -- |
| Total | 30,283 | 204,151 | 16,107 | 63,002 | 10,576 | 7,731 | 1,060 |
| All species | 50,194 | 386,750 | 30,514 | 80,612 | 13,635 | 7,758 | 1,064 |

(Table 68 continued on next page)

---

[1] Small quantities may round off to less than 500 cubic feet and will be shown as a dash in columns showing thousand cubic feet.

[2] International 1/4-inch rule.

[3] Includes black cherry.

(Table 68 continued)

| Species group | Fuelwood |  | Posts |  | Poles |  | Other Products |
|---|---|---|---|---|---|---|---|
|  | Cords | [1]Thousand cubic feet | Thousand pieces | [1]Thousand cubic feet | Pieces | [1]Thousand cubic feet | [1]Thousand cubic feet |
| SOFTWOODS |  |  |  |  |  |  |  |
| White pine | 48 | 1 | -- | -- | -- | -- | -- |
| Red pine | 77 | 3 | -- | -- | 4,024 | 34 | 5 |
| Jack pine | 106 | 4 | -- | -- | 590 | 5 | 2 |
| White spruce | 19 | -- | 47 | 48 | -- | -- | 4 |
| Black spruce | 24 | 1 | 60 | 61 | -- | -- | 4 |
| Balsam fir | 49 | 1 | 450 | 463 | -- | -- | 8 |
| Hemlock | 184 | 7 | -- | -- | -- | -- | -- |
| Tamarack | 52 | 1 | -- | -- | -- | -- | -- |
| Northern white-cedar | 476 | 30 | 1,442 | 1,484 | -- | -- | 275 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,035 | 48 | 1,999 | 2,056 | 4,614 | 39 | 298 |
| HARDWOODS: |  |  |  |  |  |  |  |
| Select white oaks | 5 | -- | -- | -- | -- | -- | -- |
| Select red oaks | 46 | 1 | -- | -- | -- | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 828 | 56 | -- | -- | -- | -- | -- |
| Hard maple | 7,175 | 502 | -- | -- | -- | -- | -- |
| Soft maple | 2,483 | 173 | -- | -- | -- | -- | 59 |
| Beech | 2,032 | 144 | -- | -- | -- | -- | 2 |
| Ash | 363 | 19 | -- | -- | -- | -- | -- |
| Balsam poplar | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 313 | 22 | -- | -- | -- | -- | 108 |
| Quaking aspen | 1,756 | 124 | -- | -- | -- | -- | 609 |
| Basswood | 7 | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- |
| Elm | 4,697 | 327 | -- | -- | -- | -- | -- |
| Paper birch | 4,973 | 347 | -- | -- | -- | -- | 47 |
| Other hardwoods | 18 | -- | -- | -- | -- | -- | -- |
| Total | 24,696 | 1,715 | -- | -- | -- | -- | 825 |
| All species | 25,731 | 1,763 | 1,999 | 2,056 | 4,614 | 39 | 1,123 |

Table 69.--Volume of primary plant residue by use and type,
Eastern Upper Peninsula, Michigan, 1978

(In thousand cubic feet)

| | Wood residue | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Coarse[1] | | Fine[2] | | Bark[3] | |
| Use | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood |
| Fiber products[4] | 516.5 | 2,825.3 | 474.9 | 2,600.3 | 41.6 | 225.0 | 15.5 | 166.5 |
| Charcoal | -- | -- | -- | -- | -- | -- | -- | -- |
| Industrial fuel | 160.9 | 1,169.7 | 35.7 | 231.2 | 125.2 | 938.5 | 292.2 | 1,188.9 |
| Domestic fuel | 170.6 | 419.9 | 170.6 | 398.9 | -- | 21.0 | 60.9 | 182.8 |
| Miscellaneous[5] | 140.9 | 526.5 | 11.1 | -- | 129.8 | 526.5 | 59.0 | 187.6 |
| Not used[6] | 393.1 | 541.9 | 180.6 | 198.8 | 212.5 | 395.1 | 331.6 | 391.8 |
| Total | 1,382.0 | 5,483.3 | 872.9 | 3,377.2 | 509.1 | 2,106.1 | 759.2 | 2,117.6 |

[1] Suitable for chipping such as slabs, edgings, veneer cores, etc.

[2] Not suitable for chipping such as sawdust, veneer clippings, etc.

[3] Does not include bark disposal at pulpmills.

[4] For manufacture of pulp, hardboard, or roofing felt.

[5] Livestock bedding, mulch, small dimension, and specialty items.

[6] Includes residue burned as waste.

Table 70.--All live shrub[1] biomass yields on commercial forest land by shrub species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In pounds per acre)

| Shrub species group | Forest type |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| TALL SHRUBS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Balsam fir | -- | 107.2 | 123.6 | 825.2 | 130.8 | 414.4 | 376.0 | -- | -- | 107.2 | 106.0 | 356.8 | 574.4 | -- | -- |
| Tamarack | -- | -- | -- | 16.8 | -- | -- | 18.8 | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | 89.6 | 419.6 | -- | 12.0 | -- | -- | -- | 7.2 | 24.4 | 148.0 | -- | -- |
| Black spruce | 65.2 | -- | 10.4 | 137.6 | -- | 672.4 | 74.4 | -- | -- | -- | -- | 13.6 | -- | -- | -- |
| Jack pine | 461.2 | 10.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.0 | -- | -- | 16.4 |
| Red pine | -- | 53.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 16.4 | -- | 9.6 | 16.8 | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | 459.6 | -- | -- | 617.2 | 4.8 | -- | -- | 81.6 | 80.4 | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18.8 | -- | 6.0 | -- | -- |
| Striped maple | -- | -- | -- | -- | -- | -- | -- | -- | 9.2 | -- | 24.0 | 8.4 | 16.8 | -- | -- |
| Red maple | -- | 136.0 | 124.8 | 25.2 | 9.2 | 58.8 | 66.4 | -- | -- | 224.4 | 111.2 | 592.8 | 6.0 | -- | -- |
| Sugar maple | -- | -- | 102.8 | 41.2 | 64.0 | -- | 17.6 | -- | -- | 41.6 | 350.0 | 46.8 | 4.0 | -- | -- |
| Mountain maple | -- | -- | -- | 114.4 | 13.6 | -- | 17.2 | 14.0 | -- | 276.4 | 17.6 | 44.4 | -- | -- | -- |
| Green alder | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 234.0 | -- | -- |
| Speckled alder | 144.8 | 212.4 | 310.4 | 466.8 | -- | 899.2 | 588.4 | 2,645.2 | -- | 457.6 | 21.6 | 137.2 | 554.4 | -- | 6.8 |
| Yellow birch | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10.8 | -- | -- | -- | -- |
| Paper birch | -- | -- | -- | 8.0 | -- | -- | 9.6 | -- | -- | 14.8 | -- | 16.0 | -- | -- | -- |
| Dogwood | -- | -- | -- | 95.6 | 23.2 | 42.0 | 49.2 | -- | -- | 14.8 | -- | 89.6 | 76.0 | -- | -- |
| Hawthorn | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 170.0 |
| Beech | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18.8 | 118.0 | -- | -- | -- | -- |
| White ash | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15.2 | -- | 23.6 | 25.2 | -- | -- |
| Black ash | -- | -- | -- | 6.0 | 10.8 | -- | 107.2 | -- | -- | 43.6 | 4.0 | 56.4 | -- | -- | -- |
| Green ash | -- | -- | -- | -- | -- | -- | 10.4 | -- | -- | -- | 12.8 | -- | -- | -- | -- |
| Black alder | -- | -- | -- | -- | -- | -- | 113.2 | -- | -- | 4.8 | -- | -- | -- | -- | -- |
| Mountain holly | -- | -- | -- | -- | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Eastern hophornbeam | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.0 | -- | -- | -- | -- |
| Balsam poplar | -- | -- | -- | 57.6 | 216.0 | -- | 24.4 | -- | -- | -- | 8.0 | 35.6 | -- | -- | -- |
| Bigtooth aspen | -- | 46.4 | -- | -- | -- | -- | -- | -- | 256.0 | -- | -- | 8.0 | -- | -- | -- |
| Quaking aspen | -- | 86.4 | -- | 5.6 | -- | 5.2 | 7.6 | -- | -- | -- | 23.6 | 186.4 | 18.4 | -- | -- |
| Black cherry | -- | -- | 4.8 | -- | 82.0 | -- | -- | -- | 4.4 | -- | 48.4 | 11.6 | 6.8 | -- | -- |
| Chokecherry | -- | -- | 6.4 | -- | -- | -- | 4.4 | -- | -- | 4.4 | -- | 41.6 | -- | -- | -- |
| Sandcherry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 58.8 |
| Northern red oak | -- | -- | -- | -- | -- | -- | -- | -- | 15.2 | -- | -- | 5.6 | -- | -- | -- |
| Sweet gale | -- | -- | -- | 81.2 | -- | -- | 6.0 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mountain ash | -- | -- | -- | -- | -- | 22.4 | -- | -- | -- | -- | -- | 6.4 | -- | -- | -- |
| Witch hazel | -- | -- | -- | 22.8 | -- | 43.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Juneberry | 4.0 | -- | 224.4 | 14.8 | -- | -- | -- | -- | -- | 6.8 | 18.0 | 12.4 | 40.4 | -- | -- |
| Hazel | -- | -- | 14.8 | 148.8 | -- | -- | 342.0 | -- | -- | 199.6 | 124.4 | 122.0 | -- | -- | -- |
| Leatherwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 | -- | -- | -- |
| Viburnum | 129.6 | 119.6 | -- | 500.4 | -- | 382.0 | 15.6 | 1,198.0 | -- | 5.6 | 11.6 | 15.2 | -- | -- | -- |
| Elder | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.8 | -- | -- | -- | -- |
| Buffaloberry | -- | -- | -- | 8.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Buttonbush | -- | -- | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Willow | -- | 148.4 | -- | 150.0 | -- | -- | 95.6 | 53.2 | -- | -- | -- | 35.2 | 48.8 | -- | -- |
| American elm | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 16.4 | -- | -- | -- | -- |
| Total | 821.2 | 919.6 | 932.0 | 3,296.4 | 969.2 | 2,548.8 | 2,573.2 | 3,915.2 | 284.8 | 1,435.6 | 1,156.8 | 1,981.2 | 1,759.2 | -- | 252.0 |

(Table 70 continued on next page)

(Table 70 continued)

| Shrub species group | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Forest type | | | | | | | | | | | | | | |
| LOW SHRUBS | | | | | | | | | | | | | | | |
| Yew | -- | -- | -- | -- | 9.9 | -- | 2.3 | -- | -- | -- | 2.0 | -- | -- | -- | -- |
| Holly | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Spirea | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.0 |
| Labrador tea | 62.7 | -- | 12.2 | -- | -- | 78.5 | 7.5 | 133.1 | -- | -- | -- | -- | -- | -- | -- |
| Leatherleaf | 52.2 | -- | 223.0 | 159.7 | -- | 369.0 | -- | -- | -- | -- | 2.2 | -- | 359.1 | -- | -- |
| Bog laurel | -- | -- | -- | -- | -- | 2.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sweetfern | 60.5 | 20.0 | -- | -- | 17.1 | 2.4 | -- | -- | 223.8 | -- | -- | -- | -- | -- | 19.5 |
| Gooseberry-currant | -- | -- | -- | 9.1 | -- | -- | 1.7 | -- | -- | 7.3 | -- | 10.8 | 1.4 | -- | 95.6 |
| Chokeberry | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.5 | -- | -- | -- | -- | -- |
| Raspberry-blackberry | -- | 122.4 | 31.2 | 45.3 | -- | -- | 9.4 | -- | -- | 49.9 | 32.9 | 35.0 | 5.5 | -- | 244.8 |
| Rose | -- | -- | 1.3 | 3.0 | 2.7 | 2.2 | 1.0 | -- | -- | -- | -- | -- | 1.1 | -- | -- |
| Black huckleberry | 20.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bilberry-blueberry | 401.5 | 334.1 | 157.3 | 25.2 | -- | 183.0 | 17.6 | -- | -- | 6.3 | 7.7 | 56.1 | 14.8 | -- | 32.8 |
| Bush honeysuckle | -- | -- | -- | -- | 3.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Honeysuckle | -- | -- | -- | 24.7 | 11.1 | 3.8 | 8.3 | -- | -- | 3.8 | 2.5 | 9.9 | 6.9 | -- | -- |
| Snowberry | -- | -- | -- | 4.4 | 5.9 | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- |
| Shrubby cinquefoil | -- | -- | -- | -- | -- | -- | 1.1 | -- | -- | -- | -- | -- | -- | -- | -- |
| St.Johns wort | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 598.0 | 476.5 | 425.0 | 271.4 | 50.6 | 641.8 | 49.9 | 133.1 | 223.8 | 68.8 | 47.3 | 111.8 | 388.8 | -- | 396.7 |
| All shrubs | 1,419.2 | 1,396.1 | 1,357.0 | 3,567.8 | 1,019.8 | 3,190.6 | 2,623.1 | 4,048.3 | 508.6 | 1,504.4 | 1,204.1 | 2,093.0 | 2,148.0 | -- | 648.7 |
| Number of plots[2] | 39 | 12 | 17 | 38 | 8 | 29 | 101 | 3 | 2 | 34 | 280 | 106 | 20 | -- | 10 |

[1] Trees under 1.0-inch d.b.h. are also included. Tree and shrub species that averaged less than 1.0 pound per acre are not included.

[2] Number of plots by forest type from which average yields were derived.

## Table 71.--All live tree biomass yields on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In pounds per acre)

| Shrub species group | Forest type |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 2,512 | 4,304 | 51,032 | 2,840 | 6,392 | 3,290 | 2,364 | 502 | 1,836 | 1,188 | 1,780 | 916 | 818 | -- | 926 |
| Red pine | 7,282 | 63,600 | 8,006 | 68 | 4,202 | 996 | 34 | 370 | 1,314 | 32 | 64 | 560 | 782 | 15,710 | 834 |
| Jack pine | 59,466 | 12,922 | 2,194 | -- | 1,790 | 4,640 | -- | -- | 112 | 8 | 58 | 1,054 | -- | -- | 910 |
| White spruce | 92 | 530 | 2,198 | 16,722 | 38,378 | 232 | 1,980 | 52 | 978 | 1,338 | 1,084 | 2,984 | 3,170 | 28,672 | 48 |
| Black spruce | 3,592 | 778 | 4,322 | 3,344 | 1,412 | 37,778 | 6,948 | 5,696 | -- | 1,142 | 334 | 1,070 | 352 | -- | 1,068 |
| Balsam fir | 46 | 932 | 2,384 | 33,594 | 14,068 | 4,050 | 14,328 | 2,890 | 414 | 10,664 | 5,314 | 13,098 | 9,912 | -- | 360 |
| Hemlock | -- | -- | 2,388 | 1,662 | 522 | 536 | 1,196 | -- | -- | 4,658 | 9,630 | 618 | 1,298 | -- | 18 |
| Tamarack | 34 | 158 | 648 | 546 | 402 | 1,836 | 3,394 | 50,404 | -- | 1,456 | 8 | 326 | 130 | -- | 590 |
| Northern white-cedar | 30 | 124 | 1,886 | 9,118 | 15,980 | 2,414 | 67,716 | 6,758 | -- | 8,010 | 1,996 | 4,540 | 9,550 | -- | 204 |
| Other softwoods | -- | 170 | -- | 28 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 126,494 | -- |
| Total | 73,054 | 83,518 | 75,058 | 67,922 | 83,146 | 55,772 | 97,960 | 66,672 | 4,654 | 28,496 | 20,268 | 25,166 | 26,012 | 170,876 | 4,958 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | -- | -- | -- | -- | -- | -- | -- | -- | 1,212 | -- | -- | 8 | 226 | -- | -- |
| Select red oaks | 608 | 76 | 36 | -- | -- | -- | -- | -- | 71,468 | 210 | 530 | 450 | 848 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | -- | 1,950 | 1,044 | 30 | 1,794 | -- | -- | 6,570 | 8,510 | 400 | 974 | -- | -- |
| Hard maple | 120 | 1,410 | 1,920 | 1,082 | 1,066 | 174 | 438 | -- | 3,564 | 2,034 | 53,306 | 2,318 | 4,746 | -- | 304 |
| Soft maple | 906 | 1,602 | 8,854 | 6,672 | 7,526 | 1,262 | 4,248 | 160 | 18,920 | 36,832 | 30,396 | 7,148 | 10,694 | -- | 272 |
| Beech | -- | 44 | 1,008 | 128 | 956 | -- | -- | -- | -- | 432 | 17,506 | 106 | 156 | -- | 62 |
| Ash | -- | -- | -- | 1,858 | 404 | -- | 3,440 | -- | -- | 22,640 | 1,920 | 2,350 | 2,918 | -- | -- |
| Balsam poplar | -- | 6 | 452 | 2,570 | 2,846 | 170 | 1,918 | 638 | -- | 1,700 | 396 | 8,516 | 2,320 | -- | 464 |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 26 | -- | -- | -- | -- |
| Bigtooth aspen | 412 | 1,594 | 812 | 196 | -- | 502 | 122 | -- | 3,444 | 346 | 1,068 | 5,576 | 1,514 | -- | 64 |
| Quaking aspen | 622 | 5,252 | 4,588 | 9,930 | 15,242 | 5,512 | 2,334 | 1,016 | 7,348 | 3,354 | 3,400 | 36,572 | 8,608 | -- | 220 |
| Basswood | -- | -- | -- | 42 | 228 | -- | 42 | -- | 1,402 | 224 | 3,332 | 474 | 50 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 68 | 886 | 100 | 130 | 200 | 26 | 16 | -- | 322 | 448 | 4,650 | 550 | 162 | -- | 132 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | -- | 90 | 422 | 354 | -- | 160 | -- | -- | 3,446 | 2,558 | 988 | 60 | -- | 412 |
| Paper birch | 1,328 | 838 | 6,032 | 8,436 | 5,484 | 2,890 | 9,764 | 1,360 | 3,170 | 5,710 | 3,132 | 10,588 | 53,840 | -- | 198 |
| Other hardwoods | -- | -- | -- | 4 | -- | -- | 2 | -- | -- | -- | 10 | 14 | -- | -- | -- |
| Noncommercial species | -- | -- | -- | 144 | -- | -- | 114 | -- | 1,598 | 148 | 1,464 | 316 | 1,090 | -- | 198 |
| Total | 4,064 | 11,708 | 23,892 | 33,564 | 35,350 | 10,566 | 24,392 | 3,174 | 112,448 | 84,094 | 132,204 | 76,374 | 88,206 | -- | 2,326 |
| All species | 77,118 | 95,226 | 98,950 | 101,486 | 118,496 | 66,338 | 122,352 | 69,846 | 117,102 | 112,590 | 152,472 | 101,540 | 114,218 | 170,876 | 7,284 |
| Number of plots[1] | 103 | 42 | 41 | 115 | 20 | 112 | 365 | 28 | 14 | 127 | 660 | 365 | 58 | 1 | 34 |

[1] Number of plots by forest type from which average yields were derived.

Table 72.--All live tree biomass on commercial forest land by species group and forest type, Eastern Upper Peninsula, Michigan, 1980

(In green tons)

| Species group | All types | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 5,462,394 | 287,770 | 300,790 | 1,752,940 | 308,767 | 96,204 | 465,662 | 703,389 |
| Red pine | 6,093,763 | 834,052 | 4,445,686 | 274,988 | 7,326 | 63,236 | 140,917 | 9,880 |
| Jack pine | 8,881,336 | 6,811,776 | 903,243 | 75,330 | -- | 26,939 | 656,721 | -- |
| White spruce | 5,102,551 | 10,623 | 36,996 | 75,466 | 1,817,694 | 577,598 | 32,955 | 588,966 |
| Black spruce | 9,240,903 | 411,484 | 54,315 | 148,436 | 363,414 | 21,246 | 5,347,386 | 2,066,431 |
| Balsam fir | 17,975,038 | 5,197 | 65,177 | 81,882 | 3,651,763 | 211,711 | 573,122 | 4,261,829 |
| Hemlock | 7,014,677 | -- | -- | 82,049 | 180,592 | 7,844 | 75,922 | 355,481 |
| Tamarack | 2,748,882 | 3,925 | 11,059 | 22,263 | 59,425 | 6,047 | 259,945 | 1,009,478 |
| Northern white-cedar | 25,922,400 | 3,319 | 8,683 | 64,753 | 991,149 | 240,484 | 341,765 | 20,142,187 |
| Other softwoods | 90,800 | -- | 11,868 | -- | 3,036 | -- | -- | -- |
| Total | 88,532,744 | 8,368,146 | 5,837,817 | 2,578,107 | 7,383,166 | 1,251,309 | 7,894,395 | 29,137,641 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 26,932 | -- | -- | -- | -- | -- | -- | -- |
| Select red oaks | 1,291,739 | 69,675 | 5,308 | 1,213 | -- | -- | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | 6,519,790 | -- | -- | -- | 211,861 | 15,722 | 4,176 | 533,355 |
| Hard maple | 32,667,429 | 13,767 | 98,615 | 65,932 | 117,554 | 16,031 | 24,711 | 130,420 |
| Soft maple | 27,148,551 | 103,798 | 112,032 | 304,129 | 725,258 | 113,276 | 178,518 | 1,263,289 |
| Beech | 10,308,596 | -- | 3,081 | 34,620 | 13,824 | 14,389 | -- | -- |
| Ash | 5,467,113 | -- | -- | -- | 201,884 | 6,089 | -- | 1,023,417 |
| Balsam poplar | 4,335,390 | -- | 373 | 15,489 | 279,429 | 42,834 | 23,984 | 570,238 |
| Cottonwood | 15,581 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 2,957,672 | 47,249 | 111,410 | 27,876 | 21,289 | -- | 71,171 | 36,317 |
| Quaking aspen | 18,523,137 | 71,136 | 367,156 | 157,590 | 1,079,354 | 229,387 | 780,152 | 693,971 |
| Basswood | 2,149,372 | -- | -- | -- | 4,540 | 3,421 | -- | 12,183 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 3,038,140 | 7,877 | 61,937 | 3,450 | 14,178 | 3,007 | 3,693 | 4,565 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 2,259,518 | -- | -- | 3,105 | 45,927 | 5,319 | -- | 47,467 |
| Paper birch | 13,688,603 | 152,127 | 58,535 | 207,189 | 917,066 | 82,523 | 409,110 | 2,904,221 |
| Other hardwoods | 11,435 | -- | -- | -- | 461 | -- | -- | 670 |
| Noncommercial species | 1,098,964 | -- | -- | -- | 15,614 | -- | -- | 33,683 |
| Total | 131,507,962 | 465,629 | 818,447 | 820,593 | 3,648,239 | 531,998 | 1,495,515 | 7,253,796 |
| All species | 220,040,706 | 8,833,775 | 6,656,264 | 3,398,700 | 11,031,405 | 1,783,307 | 9,389,910 | 36,391,437 |

(Table 72 continued on next page)

able 72 continued)

| ecies group | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| FTWOODS | | | | | | | | |
| White pine | 10,982 | 17,718 | 113,863 | 1,033,176 | 307,343 | 45,182 | -- | 18,608 |
| Red pine | 8,118 | 12,683 | 3,004 | 36,606 | 187,869 | 43,229 | 9,426 | 16,743 |
| Jack pine | -- | 1,086 | 670 | 33,258 | 354,041 | -- | -- | 18,272 |
| White spruce | 1,121 | 9,431 | 128,330 | 628,668 | 1,001,415 | 175,134 | 17,203 | 951 |
| Black spruce | 124,725 | -- | 109,523 | 193,980 | 359,126 | 19,388 | -- | 21,449 |
| Balsam fir | 63,282 | 3,991 | 1,022,616 | 3,082,641 | 4,396,930 | 547,651 | -- | 7,246 |
| Hemlock | -- | -- | 446,769 | 5,586,235 | 207,720 | 71,718 | -- | 347 |
| Tamarack | 1,103,856 | -- | 139,680 | 4,792 | 109,328 | 7,215 | -- | 11,869 |
| Northern white-cedar | 147,997 | -- | 768,096 | 1,158,118 | 1,524,167 | 527,592 | -- | 4,090 |
| Other softwoods | -- | -- | -- | -- | -- | -- | 75,896 | -- |
| Total | 1,460,081 | 44,909 | 2,732,551 | 11,757,474 | 8,447,939 | 1,437,109 | 102,525 | 99,575 |
| RDWOODS | | | | | | | | |
| Select white oaks | -- | 11,704 | -- | -- | 2,795 | 12,433 | -- | -- |
| Select red oaks | -- | 689,657 | 20,096 | 307,782 | 151,167 | 46,841 | -- | -- |
| Other red oaks | -- | -- | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | 530,009 | 4,936,879 | 133,970 | 53,818 | -- | -- |
| Hard maple | -- | 34,383 | 195,048 | 30,924,850 | 777,846 | 262,169 | -- | 6,103 |
| Soft maple | 3,482 | 182,586 | 3,532,156 | 17,634,000 | 2,399,719 | 590,832 | -- | 5,476 |
| Beech | -- | -- | 41,384 | 10,155,585 | 35,824 | 8,626 | -- | 1,263 |
| Ash | -- | -- | 2,171,220 | 1,114,394 | 788,947 | 161,162 | -- | -- |
| Balsam poplar | 13,974 | -- | 163,090 | 229,589 | 2,858,870 | 128,215 | -- | 9,305 |
| Cottonwood | -- | -- | -- | 15,581 | -- | -- | -- | -- |
| Bigtooth aspen | -- | 33,237 | 33,076 | 619,502 | 1,871,622 | 83,654 | -- | 1,269 |
| Quaking aspen | 22,249 | 70,911 | 321,659 | 1,972,418 | 12,277,131 | 475,594 | -- | 4,429 |
| Basswood | -- | 13,534 | 21,400 | 1,932,766 | 158,794 | 2,734 | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | -- | 3,110 | 42,994 | 2,697,094 | 184,676 | 8,903 | -- | 2,656 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | -- | 330,438 | 1,483,816 | 331,815 | 3,364 | -- | 8,267 |
| Paper birch | 29,761 | 30,594 | 547,634 | 1,816,706 | 3,554,532 | 2,974,625 | -- | 3,980 |
| Other hardwoods | -- | -- | -- | 5,831 | 4,473 | -- | -- | -- |
| Noncommercial species | -- | 15,429 | 14,232 | 849,626 | 106,154 | 60,264 | -- | 3,962 |
| Total | 69,466 | 1,085,145 | 8,064,436 | 76,696,419 | 25,638,335 | 4,873,234 | -- | 46,710 |
| 1 species | 1,529,547 | 1,130,054 | 10,796,987 | 88,453,893 | 34,086,274 | 6,310,343 | 102,525 | 146,285 |

Table 73.--All live tree biomass by species group and tree biomass component, Eastern Upper Peninsula, Michigan, 1980

| Species group | All components | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| | | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| | | -Green tons- | | | | |
| SOFTWOODS | | | | | | |
| White pine | 5,462,394 | 309,642 | 3,308,127 | 1,562,994 | 167,726 | 113,905 |
| Red pine | 6,093,763 | 994,027 | 3,516,397 | 1,569,077 | 9,294 | 4,968 |
| Jack pine | 8,881,336 | 1,047,822 | 5,155,181 | 2,421,314 | 160,684 | 96,335 |
| White spruce | 5,102,551 | 582,139 | 2,970,701 | 1,412,321 | 87,675 | 49,715 |
| Black spruce | 9,240,903 | 4,502,176 | 3,183,767 | 1,507,419 | 25,436 | 22,105 |
| Balsam fir | 17,975,038 | 7,999,098 | 6,635,333 | 3,077,692 | 142,984 | 119,931 |
| Hemlock | 7,014,677 | 593,060 | 3,974,008 | 1,874,061 | 352,136 | 221,412 |
| Tamarack | 2,748,882 | 1,065,176 | 1,087,483 | 525,412 | 32,627 | 38,184 |
| Northern white-cedar | 25,922,400 | 10,809,314 | 8,855,169 | 4,298,399 | 1,024,587 | 934,931 |
| Other softwoods | 90,800 | 34,198 | 37,556 | 17,458 | 1,017 | 571 |
| Total | 88,532,744 | 27,936,652 | 38,723,722 | 18,266,147 | 2,004,166 | 1,602,057 |
| HARDWOODS | | | | | | |
| Select white oaks | 26,932 | 2,795 | 12,841 | 5,586 | 3,768 | 1,942 |
| Select red oaks | 1,291,739 | 62,708 | 769,291 | 351,653 | 67,898 | 40,189 |
| Other red oaks | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- |
| Yellow birch | 6,519,790 | 444,991 | 3,241,174 | 1,623,135 | 683,406 | 527,084 |
| Hard maple | 32,667,429 | 5,428,038 | 17,112,973 | 8,063,379 | 1,252,996 | 810,043 |
| Soft maple | 27,148,551 | 5,183,125 | 13,226,831 | 6,434,481 | 1,378,963 | 925,151 |
| Beech | 10,308,596 | 827,292 | 5,140,263 | 2,528,948 | 1,072,875 | 739,218 |
| Ash | 5,467,113 | 2,264,135 | 1,998,694 | 893,471 | 179,656 | 131,157 |
| Balsam poplar | 4,335,390 | 772,566 | 2,239,502 | 1,089,790 | 129,657 | 103,875 |
| Cottonwood | 15,581 | -- | 10,509 | 5,072 | -- | -- |
| Bigtooth aspen | 2,957,672 | 179,228 | 1,748,609 | 802,296 | 133,715 | 93,824 |
| Quaking aspen | 18,523,137 | 2,720,606 | 9,296,094 | 4,329,442 | 1,272,753 | 904,242 |
| Basswood | 2,149,372 | 183,500 | 1,274,007 | 559,389 | 79,041 | 53,435 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- |
| Black cherry | 3,038,140 | 536,166 | 1,386,829 | 630,215 | 303,433 | 181,497 |
| Butternut | -- | -- | -- | -- | -- | -- |
| Elm | 2,259,518 | 189,962 | 1,278,000 | 587,441 | 121,596 | 82,519 |
| Paper birch | 13,688,603 | 2,230,151 | 7,144,605 | 3,379,362 | 577,647 | 356,838 |
| Other hardwoods | 11,435 | 1,131 | 7,088 | 3,216 | -- | -- |
| Noncommercial species | 1,098,964 | 643,934 | -- | -- | 294,640 | 160,390 |
| Total | 131,507,962 | 21,670,328 | 65,887,310 | 31,286,876 | 7,552,044 | 5,111,404 |
| All species | 220,040,706 | 49,606,980 | 104,611,032 | 49,553,023 | 9,556,210 | 6,713,461 |

(Table 73 continued on next page)

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(Table 73 continued)

| Species group | All components | Biomass component: 1- to 5-inch trees | Growing stock: Boles | Growing stock: Tops and limbs | Cull: Boles | Cull: Tops and limbs |
|---|---|---|---|---|---|---|
| | | - - - - - - - - - - - -Thousand cubic feet- - - - - - - - - - - - | | | | |
| SOFTWOODS | | | | | | |
| White pine | 301,754 | 17,131 | 182,766 | 86,344 | 9,241 | 6,272 |
| Red pine | 296,651 | 48,196 | 171,311 | 76,445 | 455 | 244 |
| Jack pine | 374,254 | 43,614 | 217,430 | 102,191 | 6,873 | 4,146 |
| White spruce | 289,538 | 32,983 | 168,613 | 80,161 | 4,967 | 2,814 |
| Black spruce | 565,425 | 274,942 | 195,203 | 92,417 | 1,535 | 1,328 |
| Balsam fir | 820,483 | 365,256 | 302,611 | 140,365 | 6,645 | 5,606 |
| Hemlock | 296,626 | 24,685 | 167,929 | 79,262 | 15,161 | 9,589 |
| Tamarack | 120,172 | 46,821 | 47,306 | 22,855 | 1,463 | 1,727 |
| Northern white-cedar | 1,769,925 | 736,580 | 608,270 | 295,256 | 68,140 | 61,679 |
| Other softwoods | 4,334 | 1,625 | 1,797 | 835 | 49 | 28 |
| Total | 4,839,162 | 1,591,833 | 2,063,236 | 976,131 | 114,529 | 93,433 |
| HARDWOODS | | | | | | |
| Select white oaks | 950 | 96 | 452 | 197 | 135 | 70 |
| Select red oaks | 45,243 | 2,153 | 26,917 | 12,305 | 2,422 | 1,446 |
| Other red oaks | -- | -- | -- | -- | -- | -- |
| Hickory | -- | -- | -- | -- | -- | -- |
| Yellow birch | 245,295 | 16,481 | 121,283 | 60,776 | 26,356 | 20,399 |
| Hard maple | 1,239,681 | 204,254 | 649,568 | 306,088 | 48,393 | 31,378 |
| Soft maple | 1,176,786 | 223,652 | 573,018 | 278,800 | 60,543 | 40,773 |
| Beech | 403,435 | 32,159 | 200,526 | 98,666 | 42,632 | 29,452 |
| Ash | 221,188 | 89,909 | 81,630 | 36,497 | 7,511 | 5,641 |
| Balsam poplar | 220,227 | 39,068 | 113,778 | 55,375 | 6,653 | 5,353 |
| Cottonwood | 666 | -- | 449 | 217 | -- | -- |
| Bigtooth aspen | 141,711 | 8,515 | 83,724 | 38,419 | 6,494 | 4,559 |
| Quaking aspen | 884,494 | 129,245 | 443,491 | 206,558 | 61,468 | 43,732 |
| Basswood | 107,028 | 9,084 | 63,420 | 27,848 | 3,975 | 2,701 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- |
| Black cherry | 137,885 | 24,017 | 62,888 | 28,583 | 13,947 | 8,450 |
| Butternut | -- | -- | -- | -- | -- | -- |
| Elm | 88,920 | 7,385 | 50,171 | 23,062 | 4,900 | 3,402 |
| Paper birch | 569,561 | 92,827 | 296,978 | 140,480 | 24,264 | 15,012 |
| Other hardwoods | 482 | 47 | 299 | 136 | -- | -- |
| Noncommercial species | 46,262 | 26,803 | -- | -- | 12,595 | 6,864 |
| Total | 5,529,814 | 905,695 | 2,768,592 | 1,314,007 | 322,288 | 219,232 |
| All species | 10,368,976 | 2,497,528 | 4,831,828 | 2,290,138 | 436,817 | 312,665 |

Table 74.--Sampling errors[1] for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land, Eastern Upper Peninsula, Michigan, 1980

| Sampling error | Commercial forest area | Growing Stock: Inventory | Growing Stock: Growth | Growing Stock: Removals | Sawtimber: Inventory | Sawtimber: Growth | Sawtimber: Removals |
|---|---|---|---|---|---|---|---|
| Percent | Thousand acres | - - - -Million cubic feet- - - - | | | - - -[2]Million board feet- - - - | | |
| 1 | 857.6 | 7,849.5 | 952.6 | 9,932.3 | 41,659.4 | 6,262.7 | 54,593.4 |
| 2 | 214.4 | 1,962.4 | 238.1 | 2,483.1 | 10,414.8 | 1,565.7 | 13,648.4 |
| 3 | 95.3 | 872.2 | 105.8 | 1,103.6 | 4,628.8 | 695.9 | 6,065.9 |
| 4 | 53.6 | 490.6 | 59.5 | 620.8 | 2,603.7 | 391.4 | 3,412.1 |
| 5 | 34.3 | 314.0 | 38.1 | 397.3 | 1,666.4 | 250.5 | 2,183.7 |
| 10 | 8.6 | 78.5 | 9.5 | 99.3 | 416.6 | 62.6 | 545.9 |
| 15 | 3.8 | 34.9 | 4.2 | 44.1 | 185.2 | 27.8 | 242.6 |
| 20 | 2.1 | 19.6 | 2.4 | 24.8 | 104.1 | 15.7 | 136.5 |
| 25 | 1.4 | 12.6 | 1.5 | 15.9 | 66.7 | 10.0 | 87.3 |
| 50 | 0.3 | 3.1 | 0.4 | 4.0 | 16.7 | 2.5 | 21.8 |
| 100 | 0.1 | 0.8 | 0.1 | 1.0 | 4.2 | 0.6 | 5.5 |

[1] At the 68-percent probability level.
[2] International 1/4-inch rule.

Smith, W. Brad.
Timber resource of Michigan's Eastern Upper Peninsula, 1980. Resour. Bull. NC-64. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 103 p.

The fourth inventory of the timber resource of Michigan's Eastern Upper Peninsula Survey Unit shows a 9 percent decline in commercial forest area and a 19 percent gain in growing-stock volume between 1966 and 1980. Presented are highlights and statistics on area, volume, growth, mortality, removals, utilization, and biomass.

KEY WORDS: Statistics, area, volume, growth, mortality, removals.

**United States Department of Agriculture**

Forest Service

North Central Forest Experiment Station

Resource Bulletin **NC-65**

# Primary Forest Products Industry and Timber Use, Indiana, 1980

James E. Blyth, Donald H. McGuire, and W. Brad Smith

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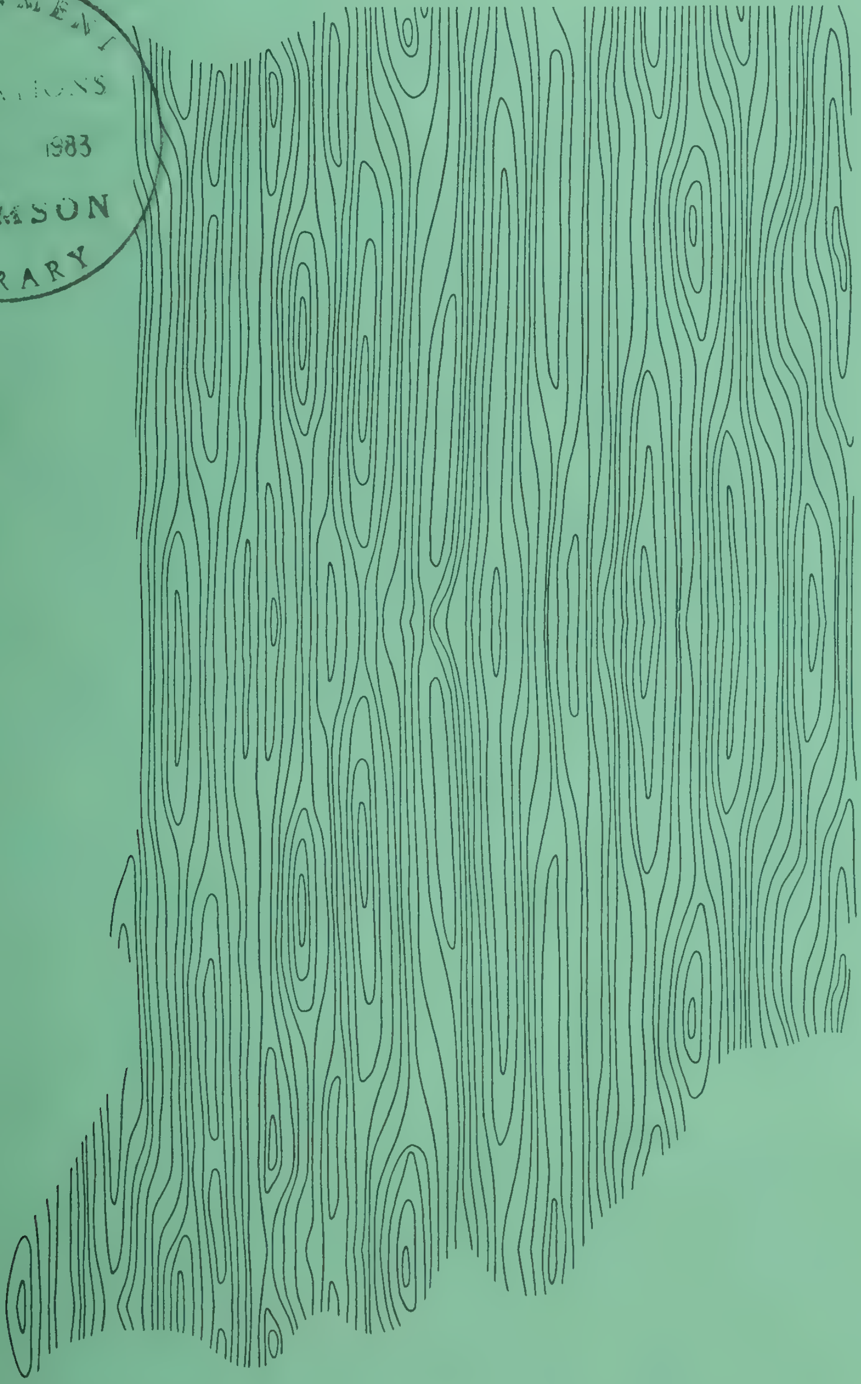

North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
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1982

# FOREWORD

This bulletin contains the results of a detailed study of forest industry, industrial roundwood production, and associated primary mill wood and bark residue in Indiana in 1980. Such detailed information is necessary for intelligent planning and decision-making in wood procurement, forest resource management, and forest industry development. Likewise, researchers need current forest industry and industrial roundwood information for planning projects.

Special thanks are given to the primary wood-using firms that supplied information for this study. Their cooperation is greatly appreciated.

Quantities shown may vary slightly from one table to another because of rounding differences, but these differences are insignificant.

# CONTENTS

*Page*

Highlights . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1
Primary Forest Industry—Industrial Roundwood . . . . . . . . 1
Timber Removals for Industrial Roundwood . . . . . . . . . . . . 2
Saw Logs . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Pulpwood . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Veneer logs . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Other Products . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Primary Mill Residue . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
Outlook . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
Appendix . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
  Study Methods . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
  Sampling Error . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5
  Definition of Terms . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5
  Common and Scientific Names
    of Tree Species Mentioned . . . . . . . . . . . . . . . . . . . . . . . . . 5
  Tables 1-14 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7

# PRIMARY FOREST PRODUCTS INDUSTRY AND TIMBER USE, INDIANA, 1980

**James E. Blyth,** *Principal Market Analyst,*
**Donald H. McGuire,** *Utilization and Marketing Forester,*
*Indiana Department of Natural Resources,*
*Indianapolis, Indiana,*
*and* **W. Brad Smith,** *Mensurationist*
*St. Paul, Minnesota*

## HIGHLIGHTS

- Industrial roundwood production in 1980 was at least 20 percent higher in each Inventory Unit than in 1966.
- Red and white oak, the leading species harvested, furnished 46 percent of the industrial roundwood.
- Indiana mills required 7 percent more industrial roundwood than Indiana forests supplied in 1980, indicating a moderate dependency on imported logs and bolts.
- On a sustained yield basis, sweetgum, basswood, and beech appear to have been overutilized in 1980; soft maple, sycamore, and aspen seem to have been underutilized.
- Saw-log production, 89 percent of all industrial roundwood, was 348 million board feet, up 48 percent from 1971.
- Major saw-log species were red oak, white oak, yellow-poplar, hickory, hard maple, and ash.
- Indiana produced 178,000 cords of pulpwood in 1980, the third largest output. However, only 40,000 cords were from roundwood; the remainder was from wood residue generated at Indiana wood-using mills.
- Indiana mills received 85 percent of the 10.7 million board feet of Indiana veneer logs cut; another 18.3 million board feet were imported.
- Coarse mill residue is in strong demand for pulp manufacturing and fuelwood; only 6 percent was not used in 1980.
- Great progress has been made since 1971 in finding markets for residue. Nevertheless, additional markets for fine and bark residue generated at primary mills are needed as more than one-fourth of the residue in each class was not used in 1980.

## PRIMARY FOREST INDUSTRY—INDUSTRIAL ROUNDWOOD

Indiana's primary wood-using industry is dominated by sawmills—of 367 active primary mills operating in 1980, an estimated 334 were sawmills. The active (operating) mill population declined from 518 in 1966. Most of the mill losses were small sawmills cutting less than one-half million board feet of lumber annually. Since 1966 the number of large and medium sawmills increased by 17. Large and medium-size sawmills are dispersed throughout Indiana with the heaviest concentration in the Knobs Unit (fig. 1).

Log and bolt receipts at active mills were 72.7 million cubic feet, up 35 percent from 1966. Compared to the previous 4 years, national markets in 1980 were weak for pallets, railroad ties, furniture, and construction materials and off slightly for paper and paperboard. Consequently, log and bolt receipts in Indiana may have been higher in recent years (1976-1979) than in 1980. Indiana received 7 percent more industrial roundwood for processing than it produced in 1980, indicating a moderate dependency on imported logs and bolts.

Industrial roundwood production in 1980 doubled since 1966 in the Knobs Unit and rose significantly in the other Units:

| **Unit** | **Production** |  |  |
|---|---|---|---|
|  | **1966** | **1980** | **Change** |
|  | (Thousand cubic feet) |  | (Percent) |
| Lower Wabash | 11,153 | 14,509 | +30 |
| Knobs | 14,099 | 28,504 | +102 |
| Upland Flats | 4,866 | 6,748 | +39 |
| Northern | 15,096 | 18,056 | +20 |
| Total | 45,214 | 67,817 | +50 |

Log production doubled in the Knobs Unit because several sawmills in that area expanded and modernized their operations and several new high-production mills began operating in this Unit since 1966.

Red oak dominated the 1980 Indiana roundwood harvest by providing more than twice as much volume as white oak, the second leading species. Together, the oaks furnished 46 percent of the volume harvested in Indiana. Other major species cut included yellow-poplar, hard maple, hickory, and ash.

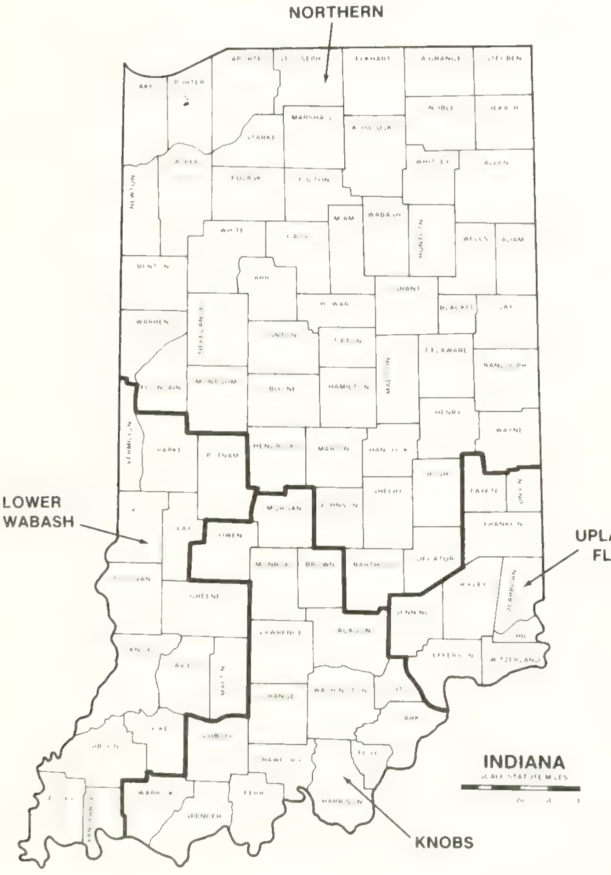

Figure 1.—*Inventory Units in Indiana. Inventory Units are the geographical areas used by the Resources Evaluation Project to report periodic inventories and use of the Nation's forest resources.*

# TIMBER REMOVALS FOR INDUSTRIAL ROUNDWOOD

Estimated timber removals (from growing stoc on commercial forest land) were 72.4 million cubi feet. Timber removals in each inventory unit pe thousand acres of commercial forest land[1] were:

| **Unit** | **Removals/thousand acres** |  |
|---|---|---|
|  | (Cubic feet) | (Cords |
| Lower Wabash | 18,630 | 236 |
| Knobs | 17,046 | 216 |
| Upland Flats | 20,396 | 258 |
| Northern | 20,775 | 263 |
| All Units | 18,587 | 235 |

Although the heaviest cutting of growing stock (on a commercial forest area basis) was in the Northern Unit, all the Units were close in harvest intensity.

Timber removals in 1980 by species were compared with net annual growth determined during the previous Indiana forest inventory (1966). These comparisons show in a rough way which species may have been overcut or undercut in 1980 (in terms of sustained yield). Species with removals greater than 110 percent of net annual growth or less than 75 percent of growth were:

| **Species** | **Removals** |
|---|---|
|  | (Percent of net annual growth) |
| Sweetgum | 161 |
| Basswood | 160 |
| Beech | 132 |
| Red oak | 117 |
| Elm | 114 |
| Hickory | 74 |
| Ash | 61 |
| Blackgum | 60 |
| Walnut | 58 |
| Soft maple | 52 |
| Sycamore | 51 |
| Aspen | 4 |

These indicators of possible overutilization or underutilization should be used cautiously because (1) wood procurement volumes change from year to year, (2) net annual growth used in the comparison was for 1966, (3) sampling errors may be high for individual minor species because only 30 percent of the sawmills were sampled, (4) stand-age structure may mask the extent of under- or overutilization, and (5) apparent overcutting or undercutting may be a temporary timber management strategy to improve stand structure and species mix.

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[1] *Area of commercial forest land in 1967 at the time of the last forest inventory in Indiana.*

Allowing for these cautions, sweetgum, basswood, and beech appear to have been overcut and soft maple, sycamore, and aspen seem to have been undercut in 1980.

## SAW LOGS

Saw logs comprised 80 percent of the industrial roundwood harvest in 1980. Loggers cut 348 million board feet of saw logs in Indiana, up 48 percent from the last saw-log production study in 1971. More than 99 percent was hardwood. Major species harvested were red oak, white oak, yellow-poplar, hickory, hard maple, and ash.

Only 5 million board feet were shipped out-of-State, primarily to Kentucky and Missouri. White oak was the major export species.

Species showing production increases of more than 15 million board feet each compared to 1971 included red oak, white oak, and yellow-poplar. Species with harvests of 5 million board feet or more each in 1980 with production gains of 75 percent or more from 1971 included white oak, yellow-poplar, hickory and black cherry. Production dropped a million board feet from 1971 for each of three species—soft maple, cottonwood, and sweetgum.

More than half the hickory and nearly half the red oak was cut in the Knobs Unit, the leading saw-log producing region. The Northern Unit was the major supplier of black walnut saw logs.

Indiana sawmills imported 21 million board feet of saw logs from 15 States but primarily from Illinois, Michigan, and Kentucky. Eleven States supplied one-third of the walnut log volume processed at Indiana sawmills. Mills in the Lower Wabash and Northern Units received most of the imports.

## PULPWOOD

Indiana produced 178,000 cords of pulpwood, exceeded only by the output in 1978 and 1979. Seventy-seven of every 100 cords (138,000 cords) was residue from sawmills, veneer mills, and other mills; the remainder (40,000 cords) was roundwood, including 2,000 cords of whole-tree chips. During the 1960's, Indiana roundwood was cut for pulpwood at twice the current rate.

Before 1965, Indiana residue was not used in manufacturing pulp. Since 1968, Indiana residue use grew rapidly and has been the dominant source of Indiana pulpwood since 1973. Softwoods are a nominal part of the pulpwood mix.

Most of the pulpwood was harvested in the Knobs and Lower Wabash Units. Ten pulpmills in Indiana, Illinois, Michigan, Ohio, Kentucky, and Tennessee received Indiana pulpwood (from roundwood and residue) in 1980.

## VENEER LOGS

Nearly half (47 percent) of the 10.7 million board feet[2] of Indiana veneer logs cut in 1980 was white oak. Output declined from 15.0 million board feet in 1976. Compared with 1976, declines were concentrated heavily in walnut. Production gains were not made in any important veneer species. Indiana veneer mills received 85 percent of the harvest; Ohio, Kentucky, Missouri, West Virginia, and Canada received the rest. Again, white oak was the chief export to other States. White oak production more than tripled in the last 10 to 15 years while walnut output fell to less than one-third the level of 1965-1970.

Sixteen Indiana veneer mills consumed 27.4 million board feet of logs and bolts. Two-thirds of the volume was imported, chiefly from Ohio, Illinois, and Kentucky. Other States each contributing more than a million board feet included Pennsylvania, Michigan, Iowa, and Oklahoma.

Principal species processed in Indiana were white and red oak, walnut, and pecan. Highest demand for imports was for white oak, red oak, and walnut. Oklahoma was the primary source of pecan. Illinois and Iowa were large suppliers of walnut to Indiana mills. Pennsylvania furnished nine-tenths of the black cherry used in Indiana.

## OTHER PRODUCTS

Other industrial roundwood products (4 percent of all industrial roundwood) cut in Indiana in 1980 were cooperage logs, handle bolts, piling, cabin logs, and shavings bolts (used primarily for poultry litter). Cooperage log production (all white oak) was 8.2

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[2] *Does not include log exports to other countries, except Canada.*

million board feet. Nearly three-fifths was cut in the Knobs Unit. Handle bolts (8.5 million board feet) were mainly ash followed by hickory and hard maple. All Units, except the Upland Flats, were important handle bolt producers.

## PRIMARY MILL RESIDUE

During 1980, Indiana primary wood-using mills (except the pulpmills) generated 532,000 green tons of coarse residue, 349,000 green tons of fine residue, and 229,000 green tons of bark. Much of this residue was used: 94 percent of the coarse, 72 percent of the fine, and 73 percent of the bark. Pulpmills and households requiring fuelwood used 85 percent of the coarse residue. Primary uses for fine residue are for industrial fuel, soil conditioners, mulch, livestock bedding, and poultry litter.

Sawmills generated 85 to 90 percent of the residue. Great progress has been made since 1971 in finding markets for residue. For sawmills in 1971, residue use included only 70 percent of the coarse, 56 percent of the fine, and 30 percent of the bark.

Finding markets for residue is usually not a problem for larger mills. Unused residue is most likely to be found at smaller mills and some medium-sized mills where residue storage may not be a problem and the volume available may be insufficient to attract customers requiring large quantities. Unused residue is often piled, used for landfill, or burned as waste.

Customers looking for unused residue will find the most in the Knobs and Lower Wabash Units. Another good source is the Upland Flats Unit where more than half the fine and bark residue was not used.

## OUTLOOK

Industrial roundwood harvesting is likely to grow when economic activity turns up. Sawmills will continue to dominate Indiana forest industry. The number of large sawmills will likely increase as the number of small sawmills declines. As a result, lumber output per mill will continue to rise. Veneer mills will presumably continue to procure three-fifths to three-quarters of their log requirements from out-of-State.

Additional market outlets should become available for fine residue and bark. If current trends continue, 85 percent or more of these residues will be used by 1987.

# APPENDIX

## STUDY METHODS

Data for this publication came from canvassing with a formal questionnaire some of the sawmills and all of the other primary wood-using mills that use Indiana logs and bolts. All canvassing in Indiana (except one pulpmill) was initially done by mail by the Indiana Division of Forestry (IDF); follow-up on nonrespondents was by mail, telephone, and personal contact. For a few Indiana mills that did not furnish complete data, IDF utilization and marketing specialists provided estimates based on prior knowledge and contacts. The North Central Forest Experiment Station (using formal questionnaires) contacted by mail an Indiana pulpmill and all out-of-State mills using Indiana roundwood; follow-up on nonrespondents was by mail and telephone. The Station edited and compiled the data.

Indiana sawmills were stratified into five production size-classes. Using a random start for a stratum, sample mills were selected within an Inventory Unit, and selection continued within each succeeding Inventory Unit until the sample was complete for that stratum. This procedure was repeated for each stratum.

The sample sizes for each stratum were:

| **Size-class** | **Sample-size** |
|---|---|
| (Thousand board feet/year) | (Mills) |
| 2000 + | All |
| 1000-1999 | 1 out of 2 |
| 500-999 | 1 out of 5 |
| 100-499 | 1 out of 10 |
| less than 100 | 1 out of 10 |

About 30 percent of all Indiana sawmills were canvassed.

Logging utilization factors developed from studies in Michigan in 1977-1978 and 1964-1965, Missouri in 1971-1972, and Indiana in 1966 were used to estimate growing stock and sawtimber removals for industrial roundwood in 1980.

# SAMPLING ERROR

## Saw Logs

All the reported figures are estimates based on the sawmill sampling procedures described above that are designed to give accurate estimates of saw log production. A measure of reliabiity of these figures is given by sampling errors. This sampling error means that the chances are two out of three that the results for the sample differ by no more than the amount indicated from the results that would have been obtained if a 100 percent sample of sawmills had been made. Sampling error for the saw log production was ± 1.32 percent on a volume of 348,240,000 board feet.

## Other Products

Because all other primary wood-using mills (than sawmills) were canvassed, there is no sampling error for the roundwood products they use.

# DEFINITION OF TERMS

**Timber removals for industrial roundwood.**—The volume of sound bole wood (between a 1-foot stump and a minimum top diameter of 4.0 inches outside bark or to a point where the central stem breaks into limbs) in poletimber and sawtimber growing-stock trees on commercial forest land removed annually for industrial roundwood products (including logging residues).

**Sawtimber removals for industrial roundwood.**—The volume of sound bole wood (between a 1-foot stump and the point on the bole above which a saw log cannot be produced) in sawtimber growing-stock trees on commercial forest land removed annually for industrial roundwood products (including logging residues). The minimum saw log top is 7.0 inches diameter outside bark for softwoods and 9.0 inches diameter outside bark for hardwoods.

**Commercial forest land.**—Forest land that is producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. Generally, this includes areas suitable for growing crops of industrial wood in excess of 20 cubic feet per acre annually.

**Industrial roundwood products.**—Saw logs, pulpwood, veneer logs, poles, commercial posts, piling, particleboard bolts, shaving bolts, lath bolts, charcoal bolts, and chips from roundwood.

**Industrial roundwood production.**—The quantity of industrial roundwood harvested in a geographic area.

**Industrial roundwood receipts.**—The quantity of industrial roundwood received in a geographic area regardless of the geographic source.

**Consumption.**—The quantity of a commodity, such as pulpwood, utilized.

**Growing-stock trees.**—All live poletimber and sawtimber trees of commercial species except rough and rotten trees. Poletimber trees are 5.0 to 8.9 inches d.b.h. for softwoods and 5.0 to 10.9 inches d.b.h. for hardwoods. Softwood sawtimber trees are 9.0 inches d.b.h. or larger; hardwood sawtimber trees are 11.0 inches d.b.h. or larger.

**Primary wood-using mill residue.**—Wood materials (coarse and fine) and bark not utilized for principal products at manufacturing plants using roundwood. These residues include wood products (byproducts) obtained incidental to production of principal products and wood materials not utilized for some product.

**Coarse mill residue.**—Wood residue suitable for chipping such as slabs, edgings, and veneer cores.

**Fine mill residue.**—Wood residue not suitable for chipping such as sawdust and veneer clippings.

# COMMON AND SCIENTIFIC NAMES OF TREE SPECIES MENTIONED

| | |
|---|---|
| SOFTWOODS | |
| Pine | |
| Shortleaf pine | *Pinus echinata* |
| Virginia pine | *Pinus virginiana* |
| Eastern white pine | *Pinus strobus* |
| Red pine | *Pinus resinosa* |
| Scotch pine | *Pinus sylvestris* |
| Cypress | *Taxodium distichum* |
| Eastern redcedar | *Juniperus virginiana* |
| HARDWOODS | |
| White oak | |
| White oak | *Quercus alba* |
| Swamp white oak | *Quercus bicolor* |
| Bur oak | *Quercus macrocarpa* |
| Swamp chestnut oak | *Quercus michauxii* |
| Chinkapin oak | *Quercus muehlenbergii* |
| Chestnut oak | *Quercus prinus* |
| Post oak | *Quercus stellata* |
| Red oak | |
| Northern red oak | *Quercus rubra* |
| Cherrybark oak | *Quercus falcata* var. *pagodaefolia* |

| | |
|---|---|
| Shumard oak | *Quercus shumardii* |
| Black oak | *Quercus velutina* |
| Scarlet oak | *Quercus coccinea* |
| Southern red oak | *Quercus falcata* |
| Shingle oak | *Quercus imbricaria* |
| Pin oak | *Quercus palustris* |
| Hickory | |
| Mockernut hickory | *Carya tomentosa* |
| Shagbark hickory | *Carya ovata* |
| Shellbark hickory | *Carya laciniosa* |
| Pecan | *Carya illinoensis* |
| Pignut hickory | *Carya glabra* |
| Bitternut hickory | *Carya cordiformis* |
| Hard maple | *Acer saccharum* |
| Soft maple | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| Beech | *Fagus grandifolia* |
| Sweetgum | *Liquidambar styraciflua* |
| Blackgum | *Nyssa sylvatica* var. *biflora* |
| Ash | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Blue ash | *Fraxinus quadrangulata* |
| Cottonwood | *Populus deltoides* |
| Aspen | |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| American basswood | *Tilia americana* |
| Yellow-poplar | *Liriodendron tulipfera* |
| Black walnut | *Juglans nigra* |
| Black cherry | *Prunus serotina* |
| Elm | |
| Winged elm | *Ulmus alata* |
| American elm | *Ulmus americana* |
| Siberian elm | *Ulmus pumila* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomasii* |
| American sycamore | *Platanus occidentalis* |
| Birch | |
| Yellow birch | *Betula alleghaniensis* |
| River birch | *Betula nigra* |
| Paper birch | *Betula papyrifera* |
| Other hardwoods | |
| Ohio buckeye | *Aesculus glabra* |
| Hackberry | *Celtis occidentalis* |
| Northern catalpa | *Catalpa speciosa* |
| Flowering dogwood | *Cornus florida* |
| Common persimmon | *Diospyros virginiana* |
| Honeylocust | *Gleditsia triacanthos* |
| Kentucky coffeetree | *Gymnocladus dioicus* |
| Butternut | *Juglans cinerea* |
| Osage-orange | *Maclura pomifera* |
| Cucumbertree | *Magnolia acuminata* |
| Black locust | *Robinia pseudoacacia* |
| Black willow | *Salix nigra* |
| Sassafras | *Sassafras albidum* |
| Boxelder | *Acer negundo* |
| Balsam poplar | *Populus balsamifera* |

# TABLE TITLES

Table 1.—Industrial roundwood production by type of product and species in Indiana, 1980.

Table 2.—Number of active primary wood-using mills in Indiana, 1961, 1966, 1971, and 1980.

Table 3.—Industrial roundwood production by species and unit in Indiana, 1980.

Table 4.—Timber removals from growing stock on commercial forest land for industrial roundwood by species and unit in Indiana, 1980.

Table 5.—Timber removals from sawtimber on commercial forest land for industrial roundwood by species and unit in Indiana, 1980.

Table 6.—Saw log production by species in Indiana, 1971 and 1980.

Table 7.—Saw log production by unit, species, and State of destination, Indiana, 1980.

Table 8.—Saw log receipts in Indiana by unit, species, and State of origin, 1980.

Table 9.—Pulpwood production in Indiana by species groups, 1965, 1970, 1975, and 1980.

Table 10.—Pulpwood production by species and unit in Indiana, 1980.

Table 11.—Veneer log production in Indiana by species, 1966, 1970, 1976, and 1980.

Table 12.—Veneer log production by species and State or country of destination, Indiana, 1980.

Table 13.—Veneer log receipts in Indiana by species and State or country of origin, 1980.

Table 14.—Residue produced at primary wood-using mills by type of material, type of use, and unit, Indiana, 1980.

Table.1--Industrial roundwood production by type of product and species in Indiana, 1980

| Species | Sawlogs | | Veneer logs | | Pulpwood | | Handle bolts | | Cooperage logs | | Other products | All products |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1/ (MBF) | 2/ (MCF) | 1/ (MBF) | 2/ (MCF ) | 3/ (CORDS) | 2/ (MCF) | 1/ (MBF) | 2/ (MCF) | 1)/ (MBF) | 2/ (MCF) | (MCF)2/ | (MCF)2/ |
| Softwoods | | | | | | | | | | | | |
| Cypress | 28 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Pine | 268 | 45 | 0 | 0 | 1400 | 111 | 0 | 0 | 0 | 0 | 5 | 161 |
| Redcedar | 83 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| Total | 379 | 65 | 0 | 0 | 1400 | 111 | 0 | 0 | 0 | 0 | 5 | 181 |
| Hardwoods | | | | | | | | | | | | |
| Ash | 19,848 | 3,342 | 301 | 40 | 2,071 | 163 | 5,700 | 917 | 0 | 0 | 1 | 4,463 |
| Aspen | 215 | 37 | 0 | 0 | 363 | 27 | 0 | 0 | 0 | 0 | 0 | 64 |
| Basswood | 4,997 | 877 | 16 | 2 | 479 | 36 | 0 | 0 | 0 | 0 | 1 | 916 |
| Beech | 12,053 | 2,029 | 40 | 5 | 1,771 | 139 | 0 | 0 | 0 | 0 | 0 | 2,173 |
| Birch | 699 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 127 |
| Blackgum | 2,521 | 440 | 20 | 3 | 678 | 54 | 0 | 0 | 0 | 0 | 0 | 497 |
| Black cherry | 4,989 | 877 | 44 | 6 | 788 | 64 | 0 | 0 | 0 | 0 | 0 | 947 |
| Cottonwood | 12,215 | 2,146 | 431 | 59 | 828 | 64 | 0 | 0 | 0 | 0 | 114 | 2,383 |
| Elm | 1,743 | 305 | 41 | 6 | 589 | 47 | 0 | 0 | 0 | 0 | 2 | 360 |
| Pecan | 1,411 | 236 | 354 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 285 |
| Other hickory | 25,229 | 4,251 | 0 | 0 | 0 | 0 | 1,971 | 318 | 0 | 0 | 13 | 4,582 |
| Hard maple | 25,589 | 4,153 | 234 | 32 | 3,724 | 295 | 831 | 133 | 0 | 0 | 0 | 4,613 |
| Soft maple | 15,526 | 2,728 | 167 | 23 | 2,147 | 170 | 0 | 0 | 0 | 0 | 68 | 2,989 |
| Red oak | 119,094 | 20,904 | 1,565 | 214 | 8,730 | 692 | 0 | 0 | 0 | 0 | 29 | 21,839 |
| White oak | 38,172 | 6,700 | 5,034 | 688 | 8,962 | 709 | 0 | 0 | 8,153 | 1,344 | 0 | 9,441 |
| Sweetgum | 3,497 | 614 | 206 | 29 | 965 | 75 | 0 | 0 | 0 | 0 | 13 | 731 |
| Sycamore | 13,916 | 2,443 | 213 | 29 | 2,960 | 231 | 0 | 0 | 0 | 0 | 21 | 2,724 |
| Black walnut | 9,335 | 1,431 | 1,231 | 174 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,605 |
| Yellow poplar | 35,473 | 6,230 | 825 | 113 | 3,819 | 302 | 0 | 0 | 0 | 0 | 7 | 6,652 |
| Other hardwoods | 1,339 | 234 | 16 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 245 |
| Total | 347,861 | 60,094 | 10,738 | 1,474 | 38,874 | 3,068 | 8,502 | 1,368 | 8,153 | 1,344 | 288 | 67,636 |
| All species | 348,240 | 60,159 | 10,738 | 1,474 | 40,274 | 3,179 | 8,502 | 1,368 | 8,153 | 1,344 | 293 | 67,817 |

[1] Thousand board feet, International 1/4-inch rule.

[2] Thousand cubic feet.

[3] Standard cords.

## Table 2.--Number of active primary wood-using mills in Indiana, 1961, 1966, 1971, and 1980

| Kind of mill[1] | 1961 | 1966 | 1971 | 1980 |
|---|---|---|---|---|
| Sawmills | | | | |
| Large[2] | [3] | 86 | 77 | 99 |
| Medium[4] | [3] | 55 | 52 | 59 |
| Small | [3] | 339 | 256 | 176 |
| Subtotal[5] | 400 | 480 | 385 | 334 |
| Veneer mills | 19 | 21 | 18 | 16 |
| Handle plants | 7 | 4 | [6] | 7 |
| Cooperage mills | 10 | 7 | [6] | 6 |
| Pulp mills | 3 | 2 | 1 | 1 |
| Other mills [7] | 5 | 4 | [6] | 3 |
| Total | 444 | 518 | [6] | 367 |

[1] Number of active sawmills estimated in 1980.

[2] Annual lumber production in excess of 1 million board feet.

[3] Data not available by mill size.

[4] Annual lumber production from 1/2 to 1 million board feet.

[5] Sawmill totals for 1961 do not include a number of small sawmills.

[6] Not available.

[7] Includes shavings, cabin log, and excelsior plants.

## Table 3.--Industrial roundwood production by species and unit in Indiana, 1980

(In thousand cubic feet)

| Species | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| Cypress | 5 | 5 | 0 | 0 | 0 |
| Pine | 161 | 0 | 38 | 12 | 111 |
| Redcedar | 15 | 0 | 11 | 0 | 4 |
| Total | 181 | 5 | 49 | 12 | 115 |
| HARDWOODS | | | | | |
| Ash | 4,463 | 1,089 | 1,407 | 480 | 1,487 |
| Aspen | 64 | 20 | 30 | 1 | 13 |
| Basswood | 916 | 108 | 173 | 76 | 559 |
| Beech | 2,173 | 384 | 889 | 295 | 605 |
| Birch | 127 | 47 | 64 | 16 | 0 |
| Blackgum | 497 | 88 | 297 | 78 | 34 |
| Black cherry | 947 | 109 | 392 | 101 | 345 |
| Cottonwood | 2,383 | 843 | 411 | 214 | 915 |
| Elm | 360 | 93 | 109 | 45 | 113 |
| Pecan | 285 | 194 | 53 | 4 | 34 |
| Other hickory | 4,582 | 880 | 2,482 | 515 | 705 |
| Hard maple | 4,613 | 549 | 1,744 | 353 | 1,967 |
| Soft maple | 2,989 | 1,029 | 687 | 316 | 957 |
| Red oak | 21,839 | 4,457 | 10,542 | 1,985 | 4,855 |
| White oak | 9,441 | 1,509 | 4,237 | 907 | 2,788 |
| Sweetgum | 731 | 162 | 401 | 151 | 17 |
| Sycamore | 2,724 | 774 | 792 | 382 | 776 |
| Black walnut | 1,605 | 273 | 435 | 193 | 704 |
| Yellow-poplar | 6,652 | 1,883 | 3,252 | 618 | 899 |
| Other hardwoods | 245 | 13 | 58 | 6 | 168 |
| Total | 67,636 | 14,504 | 28,455 | 6,736 | 17,941 |
| All species | 67,817 | 14,509 | 28,504 | 6,748 | 18,056 |

## Table 4.--Timber removals from growing stock on commercial forest land for industrial roundwood by species and unit in Indiana, 1980

(In thousand cubic feet)

| Species | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| Cypress | 6 | 6 | 0 | 0 | 0 |
| Pine | 162 | 0 | 39 | 13 | 110 |
| Redcedar | 16 | 0 | 12 | 0 | 4 |
| Total | 184 | 6 | 51 | 13 | 114 |
| HARDWOODS | | | | | |
| Ash | 5,275 | 1,309 | 1,625 | 569 | 1,772 |
| Aspen | 60 | 19 | 28 | 1 | 12 |
| Basswood | 1,023 | 119 | 187 | 86 | 631 |
| Beech | 2,293 | 411 | 926 | 304 | 652 |
| Birch | 137 | 50 | 69 | 18 | 0 |
| Blackgum | 543 | 93 | 322 | 89 | 39 |
| Black cherry | 1,042 | 118 | 426 | 112 | 386 |
| Cottonwood | 2,669 | 942 | 459 | 242 | 1,026 |
| Elm | 388 | 98 | 114 | 50 | 126 |
| Pecan | 311 | 209 | 59 | 4 | 39 |
| Other hickory | 5,121 | 1,019 | 2,785 | 555 | 762 |
| Hard maple | 5,039 | 586 | 1,906 | 382 | 2,165 |
| Soft maple | 3,308 | 1,119 | 761 | 352 | 1,076 |
| Red oak | 22,338 | 4,548 | 10,751 | 2,020 | 5,019 |
| White oak | 9,744 | 1,562 | 4,343 | 937 | 2,902 |
| Sweetgum | 796 | 172 | 437 | 168 | 19 |
| Sycamore | 2,986 | 844 | 837 | 433 | 872 |
| Black walnut | 1,470 | 249 | 399 | 177 | 645 |
| Yellow-poplar | 7,406 | 2,091 | 3,607 | 695 | 1,013 |
| Other hardwoods | 277 | 14 | 66 | 7 | 190 |
| Total | 72,226 | 15,572 | 30,107 | 7,201 | 19,346 |
| All species | 72,410 | 15,578 | 30,158 | 7,214 | 19,460 |

Table 5.--Timber removals from sawtimber on commercial forest land for industrial roundwood by species and unit in Indiana, 1980

(In thousand board feet)[1]

| Species | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| Cypress | 27 | 27 | 0 | 0 | 0 |
| Pine | 440 | 0 | 216 | 75 | 149 |
| Redcedar | 79 | 0 | 59 | 0 | 20 |
| Total | 546 | 27 | 275 | 75 | 169 |
| HARDWOODS | | | | | |
| Ash | 26,471 | 6,453 | 8,259 | 2,822 | 8,937 |
| Aspen | 269 | 91 | 119 | 6 | 53 |
| Basswood | 5,233 | 609 | 946 | 439 | 3,239 |
| Beech | 12,516 | 2,252 | 5,023 | 1,641 | 3,600 |
| Birch | 761 | 272 | 383 | 106 | 0 |
| Blackgum | 2,755 | 464 | 1,632 | 453 | 206 |
| Black cherry | 5,324 | 600 | 2,167 | 575 | 1,982 |
| Cottonwood | 13,789 | 4,882 | 2,401 | 1,254 | 5,252 |
| Elm | 1,972 | 489 | 577 | 256 | 650 |
| Pecan | 1,795 | 1,171 | 361 | 31 | 232 |
| Other hickory | 27,330 | 5,264 | 14,823 | 3,061 | 4,182 |
| Hard maple | 27,898 | 3,268 | 10,360 | 1,963 | 12,307 |
| Soft maple | 16,924 | 5,723 | 3,892 | 1,805 | 5,504 |
| Red oak | 115,966 | 23,539 | 55,703 | 10,482 | 26,242 |
| White oak | 51,344 | 8,203 | 22,861 | 5,007 | 15,273 |
| Sweetgum | 4,099 | 897 | 2,241 | 865 | 96 |
| Sycamore | 15,247 | 4,309 | 4,215 | 2,241 | 4,482 |
| Black walnut | 9,300 | 1,573 | 2,530 | 1,119 | 4,078 |
| Yellow-poplar | 38,027 | 10,688 | 18,543 | 3,568 | 5,228 |
| Other hardwoods | 1,435 | 80 | 340 | 40 | 975 |
| Total | 378,455 | 80,827 | 157,376 | 37,734 | 102,518 |
| All species | 379,001 | 80,854 | 157,651 | 37,809 | 102,687 |

[1] International 1/4-inch rule.

## Table 6.--Saw log production by species in Indiana, 1971 and 1980

(In thousand board feet)[1]

| Species | 1971 | 1980 | Change |
|---|---|---|---|
| SOFTWOODS | | | |
| Cypress | 0 | 28 | 28 |
| Pine | 171 | 268 | 97 |
| Redcedar | 0 | 83 | 83 |
| Total | 171 | 379 | 208 |
| HARDWOODS | | | |
| Ash | 13,822 | 19,848 | 6,026 |
| Aspen | 89 | 215 | 126 |
| Basswood | 3,366 | 4,997 | 1,631 |
| Beech | 9,097 | 12,053 | 2,956 |
| Blackgum | 1,279 | 2,521 | 1,242 |
| Black cherry | 1,618 | 4,989 | 3,371 |
| Cottonwood | 13,495 | 12,215 | -1,280 |
| Elm | 1,493 | 1,743 | 250 |
| Pecan (hickory) | 702 | 1,411 | 709 |
| Other hickory | 13,509 | 25,229 | 11,720 |
| Hard maple | 17,824 | 25,589 | 7,765 |
| Soft maple | 16,557 | 15,526 | -1,031 |
| Red oak | 76,868 | 119,094 | 42,226 |
| White oak | 20,896 | 38,172 | 17,276 |
| Sweetgum | 4,566 | 3,497 | -1,069 |
| Sycamore | 12,612 | 13,916 | 1,304 |
| Black walnut | 5,825 | 9,335 | 3,510 |
| Yellow-poplar | 19,972 | 35,473 | 15,501 |
| Other hardwoods | 1,621 | 2,038 | 417 |
| Total | 235,211 | 347,861 | 112,650 |
| All species | 235,382 | 348,240 | 112,858 |

[1] International 1/4-inch rule.

## Table 7.--Saw log production by unit, species, and state of destination, Indiana, 1980

(In thousand board feet)1/

| Species | Indiana | Kentucky | Missouri | Ohio | Other States | Total |
|---|---|---|---|---|---|---|
| ALL UNITS | | | | | | |
| SOFTWOODS | | | | | | |
| Cypress | 0 | 28 | 0 | 0 | 0 | 28 |
| Pine | 268 | 0 | 0 | 0 | 0 | 268 |
| Redcedar | 62 | 0 | 0 | 21 | 0 | 83 |
| Total | 330 | 28 | 0 | 21 | 0 | 379 |
| HARDWOODS | | | | | | |
| Ash | 19,793 | 7 | 48 | 0 | 0 | 19,848 |
| Aspen | 215 | 0 | 0 | 0 | 0 | 215 |
| Basswood | 4,983 | 14 | 0 | 0 | 0 | 4,997 |
| Beech | 12,046 | 0 | 0 | 7 | 0 | 12,053 |
| Birch | 699 | 0 | 0 | 0 | 0 | 699 |
| Blackgum | 2,521 | 0 | 0 | 0 | 0 | 2,521 |
| Black cherry | 4,965 | 0 | 9 | 14 | 1 | 4,989 |
| Cottonwood | 12,208 | 0 | 0 | 7 | 0 | 12,215 |
| Elm | 1,743 | 0 | 0 | 0 | 0 | 1,743 |
| Pecan | 1,411 | 0 | 0 | 0 | 0 | 1,411 |
| Other hickory | 25,186 | 35 | 0 | 7 | 1 | 25,229 |
| Hard maple | 25,554 | 35 | 0 | 0 | 0 | 25,589 |
| Soft maple | 15,250 | 276 | 0 | 0 | 0 | 15,526 |
| Red oak | 117,965 | 690 | 425 | 14 | 0 | 119,094 |
| White oak | 35,681 | 959 | 1531 | 0 | 1 | 38,172 |
| Sweetgum | 3,152 | 345 | 0 | 0 | 0 | 3,497 |
| Sycamore | 13,916 | 0 | 0 | 0 | 0 | 13,916 |
| Black walnut | 8,889 | 443 | 0 | 0 | 3 | 9,335 |
| Yellow poplar | 35,465 | 0 | 0 | 7 | 1 | 35,473 |
| Other hardwoods | 1,339 | 0 | 0 | 0 | 0 | 1,339 |
| Total | 342,981 | 2,804 | 2013 | 56 | 7 | 347,861 |
| All species | 343,311 | 2,832 | 2013 | 77 | 7 | 348,240 |
| LOWER WABASH UNIT | | | | | | |
| SOFTWOODS | | | | | | |
| Cypress | 0 | 28 | 0 | 0 | 0 | 28 |
| Pine | 0 | 0 | 0 | 0 | 0 | 0 |
| Redcedar | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 28 | 0 | 0 | 0 | 28 |
| HARDWOODS | | | | | | |
| Ash | 4,437 | 0 | 20 | 0 | 0 | 4,457 |
| Aspen | 87 | 0 | 0 | 0 | 0 | 87 |
| Basswood | 562 | 7 | 0 | 0 | 0 | 569 |
| Beech | 2,224 | 0 | 0 | 0 | 0 | 2,224 |
| Birch | 225 | 0 | 0 | 0 | 0 | 225 |
| Blackgum | 401 | 0 | 0 | 0 | 0 | 401 |
| Black cherry | 554 | 0 | 2 | 0 | 1 | 557 |
| Cottonwood | 3,924 | 0 | 0 | 0 | 0 | 3,924 |
| Elm | 420 | 0 | 0 | 0 | 0 | 420 |
| Pecan | 1,093 | 0 | 0 | 0 | 0 | 1,093 |
| Other hickory | 4,454 | 14 | 0 | 0 | 1 | 4,469 |
| Hard maple | 3,090 | 0 | 0 | 0 | 0 | 3,090 |
| Soft maple | 4,799 | 0 | 0 | 0 | 0 | 4,799 |
| Red oak | 24,298 | 0 | 116 | 0 | 0 | 24,414 |
| White oak | 5,514 | 40 | 292 | 0 | 1 | 5,847 |
| Sweetgum | 570 | 69 | 0 | 0 | 0 | 639 |
| Sycamore | 3,808 | 0 | 0 | 0 | 0 | 3,808 |
| Black walnut | 1,544 | 126 | 0 | 0 | 3 | 1,673 |
| Yellow poplar | 10,045 | 0 | 0 | 0 | 1 | 10,046 |
| Other hardwoods | 17 | 0 | 0 | 0 | 0 | 17 |
| Total | 72,066 | 256 | 430 | 0 | 7 | 72,759 |
| All species | 72,066 | 284 | 430 | 0 | 7 | 72,787 |

(Table 7 continued on next page)

(Table 7 continued)

KNOBS UNIT

| | | | | | | |
|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | |
| Cypress | 0 | 0 | 0 | 0 | 0 | 0 |
| Pine | 191 | 0 | 0 | 0 | 0 | 191 |
| Redcedar | 62 | 0 | 0 | 0 | 0 | 62 |
| Total | 253 | 0 | 0 | 0 | 0 | 253 |
| HARDWOODS | | | | | | |
| Ash | 2,038 | 0 | 0 | 0 | 0 | 2,038 |
| Aspen | 0 | 0 | 0 | 0 | 0 | 0 |
| Basswood | 427 | 0 | 0 | 0 | 0 | 427 |
| Beech | 1,528 | 0 | 0 | 0 | 0 | 1,528 |
| Birch | 103 | 0 | 0 | 0 | 0 | 103 |
| Blackgum | 439 | 0 | 0 | 0 | 0 | 439 |
| Black cherry | 552 | 0 | 0 | 0 | 0 | 552 |
| Cottonwood | 1,178 | 0 | 0 | 0 | 0 | 1,178 |
| Elm | 244 | 0 | 0 | 0 | 0 | 244 |
| Pecan | 6 | 0 | 0 | 0 | 0 | 6 |
| Other hickory | 3,037 | 0 | 0 | 0 | 0 | 3,037 |
| Hard maple | 1,472 | 0 | 0 | 0 | 0 | 1,472 |
| Soft maple | 1,739 | 0 | 0 | 0 | 0 | 1,739 |
| Red oak | 10,614 | 0 | 0 | 0 | 0 | 10,614 |
| White oak | 3,002 | 18 | 0 | 0 | 0 | 3,020 |
| Sweetgum | 797 | 0 | 0 | 0 | 0 | 797 |
| Sycamore | 2,128 | 0 | 0 | 0 | 0 | 2,128 |
| Black walnut | 1,087 | 17 | 0 | 0 | 0 | 1,104 |
| Yellow poplar | 3,434 | 0 | 0 | 0 | 0 | 3,434 |
| Other hardwoods | 39 | 0 | 0 | 0 | 0 | 39 |
| Total | 33,864 | 35 | 0 | 0 | 0 | 33,899 |
| All species | 33,941 | 35 | 0 | 0 | 0 | 33,976 |

UPLAND FLATS UNIT

| Species | Indiana | Kentucky | Missouri | Ohio | Other States | Total |
|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | |
| Cypress | 0 | 0 | 0 | 0 | 0 | 0 |
| Pine | 77 | 0 | 0 | 0 | 0 | 77 |
| Redcedar | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 77 | 0 | 0 | 0 | 0 | 77 |
| HARDWOODS | | | | | | |
| Ash | 6,390 | 0 | 28 | 0 | 0 | 6,418 |
| Aspen | 88 | 0 | 0 | 0 | 0 | 88 |
| Basswood | 852 | 7 | 0 | 0 | 0 | 859 |
| Beech | 4,758 | 0 | 0 | 0 | 0 | 4,758 |
| Birch | 371 | 0 | 0 | 0 | 0 | 371 |
| Blackgum | 1,479 | 0 | 0 | 0 | 0 | 1,479 |
| Black cherry | 1,989 | 0 | 7 | 0 | 0 | 1,996 |
| Cottonwood | 2,039 | 0 | 0 | 0 | 0 | 2,039 |
| Elm | 486 | 0 | 0 | 0 | 0 | 486 |
| Pecan | 174 | 0 | 0 | 0 | 0 | 174 |
| Other hickory | 13,548 | 14 | 0 | 0 | 0 | 13,562 |
| Hard maple | 9,147 | 0 | 0 | 0 | 0 | 9,147 |
| Soft maple | 3,379 | 276 | 0 | 0 | 0 | 3,655 |
| Red oak | 56,140 | 690 | 309 | 0 | 0 | 57,139 |
| White oak | 12,730 | 861 | 1,239 | 0 | 0 | 14,830 |
| Sweetgum | 1,691 | 276 | 0 | 0 | 0 | 1,967 |
| Sycamore | 3,712 | 0 | 0 | 0 | 0 | 3,712 |
| Black walnut | 2,233 | 151 | 0 | 0 | 0 | 2,384 |
| Yellow poplar | 17,051 | 0 | 0 | 0 | 0 | 17,051 |
| Other hardwoods | 327 | 0 | 0 | 0 | 0 | 327 |
| Total | 138,584 | 2,275 | 1,583 | 0 | 0 | 142,442 |
| All species | 138,837 | 2,275 | 1,583 | 0 | 0 | 142,695 |

(Table 7 continued on next page)

(Table 7 continued)

NORTHERN UNIT

| Species | Indiana | Kentucky | Missouri | Ohio | Other States | Total |
|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | |
| Cypress | 0 | 0 | 0 | 0 | 0 | 0 |
| Pine | 0 | 0 | 0 | 0 | 0 | 0 |
| Redcedar | 0 | 0 | 0 | 21 | 0 | 21 |
| Total | 0 | 0 | 0 | 21 | 0 | 21 |
| HARDWOODS | | | | | | |
| Ash | 6,928 | 7 | 0 | 0 | 0 | 6,935 |
| Aspen | 40 | 0 | 0 | 0 | 0 | 40 |
| Basswood | 3,142 | 0 | 0 | 0 | 0 | 3,142 |
| Beech | 3,536 | 0 | 0 | 7 | 0 | 3,543 |
| Birch | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 202 | 0 | 0 | 0 | 0 | 202 |
| Black cherry | 1,870 | 0 | 0 | 14 | 0 | 1,884 |
| Cottonwood | 5,067 | 0 | 0 | 7 | 0 | 5,074 |
| Elm | 593 | 0 | 0 | 0 | 0 | 593 |
| Pecan | 138 | 0 | 0 | 0 | 0 | 138 |
| Other hickory | 4,147 | 7 | 0 | 7 | 0 | 4,161 |
| Hard maple | 11,845 | 35 | 0 | 0 | 0 | 11,880 |
| Soft maple | 5,333 | 0 | 0 | 0 | 0 | 5,333 |
| Red oak | 26,913 | 0 | 0 | 14 | 0 | 26,927 |
| White oak | 14,435 | 40 | 0 | 0 | 0 | 14,475 |
| Sweetgum | 94 | 0 | 0 | 0 | 0 | 94 |
| Sycamore | 4,268 | 0 | 0 | 0 | 0 | 4,268 |
| Black walnut | 4,025 | 149 | 0 | 0 | 0 | 4,174 |
| Yellow poplar | 4,935 | 0 | 0 | 7 | 0 | 4,942 |
| Other hardwoods | 956 | 0 | 0 | 0 | 0 | 956 |
| Total | 98,467 | 238 | 0 | 56 | 0 | 98,761 |
| All species | 98,467 | 238 | 0 | 77 | 0 | 98,782 |

[1] International 1/4-inch rule.

Table 8.--Saw log receipts in Indiana by unit species and state of origin, 1980

(In thousand board feet)1/

ALL UNITS

| Species | All States | Indiana | Illinois | Michigan | Kentucky | Ohio | Iowa | Missouri | Penna. | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | |
| Pine | 268 | 268 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Redcedar | 62 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 330 | 330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HARDWOODS | | | | | | | | | | |
| Ash | 20,767 | 19,793 | 220 | 454 | 116 | 184 | 0 | 0 | 0 | 0 |
| Aspen | 216 | 215 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Basswood | 5,204 | 4,983 | 7 | 167 | 23 | 24 | 0 | 0 | 0 | 0 |
| Beech | 12,534 | 12,046 | 148 | 273 | 28 | 39 | 0 | 0 | 0 | 0 |
| Birch | 767 | 699 | 62 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 2,698 | 2,521 | 166 | 0 | 11 | 0 | 0 | 0 | 0 | 0 |
| Black cherry | 5,352 | 4,965 | 8 | 270 | 71 | 24 | 0 | 0 | 14 | 0 |
| Cottonwood | 12,329 | 12,208 | 90 | 17 | 12 | 2 | 0 | 0 | 0 | 0 |
| Elm | 1,856 | 1,743 | 30 | 38 | 9 | 8 | 0 | 0 | 0 | 28 |
| Pecan | 1,448 | 1,411 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| Other hickory | 26,462 | 25,186 | 807 | 180 | 241 | 41 | 0 | 3 | 0 | 4 |
| Hard maple | 26,749 | 25,554 | 93 | 844 | 144 | 114 | 0 | 0 | 0 | 0 |
| Soft maple | 16,998 | 15,250 | 982 | 639 | 22 | 105 | 0 | 0 | 0 | 0 |
| Red oak | 124,010 | 117,965 | 3,154 | 1,661 | 1,000 | 229 | 0 | 0 | 0 | 1 |
| White oak | 37,318 | 35,681 | 335 | 423 | 642 | 198 | 0 | 4 | 21 | 14 |
| Sweetgum | 3,222 | 3,152 | 58 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| Sycamore | 14,573 | 13,916 | 525 | 73 | 27 | 32 | 0 | 0 | 0 | 0 |
| Black walnut | 13,446 | 8,889 | 1,560 | 223 | 717 | 457 | 752 | 220 | 149 | 479 |
| Yellow poplar | 36,640 | 35,465 | 254 | 309 | 596 | 16 | 0 | 0 | 0 | 0 |
| Other hardwoods | 1,415 | 1,339 | 0 | 40 | 0 | 33 | 0 | 0 | 0 | 3 |
| Total | 364,004 | 342,981 | 8,517 | 5,612 | 3,677 | 1,506 | 752 | 227 | 184 | 548 |
| All species | 364,334 | 343,311 | 8,517 | 5,612 | 3,677 | 1,506 | 752 | 227 | 184 | 548 |

(Table 8 continued on next page)

(Table 8 continued)

| Species | All States | LOWER WABASH UNIT<br>Indiana | Illinois | Oklahoma | Kentucky | Missouri | Mississippi | Texas | Louisiana |
|---|---|---|---|---|---|---|---|---|---|
| HARDWOODS | | | | | | | | | |
| Ash | 5,316 | 5,096 | 219 | 0 | 1 | 0 | 0 | 0 | 0 |
| Aspen | 142 | 142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Basswood | 696 | 689 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beech | 2,613 | 2,465 | 148 | 0 | 0 | 0 | 0 | 0 | 0 |
| Birch | 258 | 196 | 62 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 551 | 385 | 166 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black cherry | 731 | 723 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cottonwood | 4,067 | 3,977 | 90 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elm | 570 | 512 | 30 | 28 | 0 | 0 | 0 | 0 | 0 |
| Pecan | 1,123 | 1,093 | 18 | 0 | 0 | 0 | 7 | 4 | 1 |
| Other hickory | 5,722 | 4,911 | 807 | 0 | 1 | 3 | 0 | 0 | 0 |
| Hard maple | 3,225 | 3,132 | 93 | 0 | 0 | 0 | 0 | 0 | 0 |
| Soft maple | 5,863 | 4,881 | 982 | 0 | 0 | 0 | 0 | 0 | 0 |
| Red oak | 25,841 | 22,686 | 3,154 | 0 | 1 | 0 | 0 | 0 | 0 |
| White oak | 5,587 | 5,282 | 297 | 0 | 4 | 4 | 0 | 0 | 0 |
| Sweetgum | 596 | 538 | 58 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sycamore | 3,766 | 3,241 | 525 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black walnut | 2,198 | 2,089 | 105 | 0 | 4 | 0 | 0 | 0 | 0 |
| Yellow poplar | 11,324 | 11,070 | 254 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other hardwoods | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| All species | 80,202 | 73,121 | 7,023 | 28 | 11 | 7 | 7 | 4 | 1 |

(Table 8 continued on next page)

(Table 8 continued)

| | KNOBS UNIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species | All States | Indiana | Kentucky | Illinois | Missouri | Penna. | Oklahoma | Tennessee |
| SOFTWOODS. | | | | | | | | |
| Pine | 268 | 268 | 0 | 0 | 0 | 0 | 0 | 0 |
| Redcedar | 62 | 62 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 330 | 330 | 0 | 0 | 0 | 0 | 0 | 0 |
| HARDWOODS | | | | | | | | |
| Ash | 5,770 | 5,676 | 94 | 0 | 0 | 0 | 0 | 0 |
| Aspen | 46 | 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| Basswood | 738 | 715 | 23 | 0 | 0 | 0 | 0 | 0 |
| Beech | 4,394 | 4,366 | 28 | 0 | 0 | 0 | 0 | 0 |
| Birch | 316 | 310 | 6 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 1,520 | 1,509 | 11 | 0 | 0 | 0 | 0 | 0 |
| Black cherry | 1,845 | 1,764 | 67 | 0 | 0 | 14 | 0 | 0 |
| Cottonwood | 1,939 | 1,927 | 12 | 0 | 0 | 0 | 0 | 0 |
| Elm | 426 | 418 | 8 | 0 | 0 | 0 | 0 | 0 |
| Pecan | 187 | 180 | 0 | 0 | 0 | 0 | 7 | 0 |
| Other hickory | 14,102 | 13,863 | 239 | 0 | 0 | 0 | 0 | 0 |
| Hard maple | 9,447 | 9,303 | 144 | 0 | 0 | 0 | 0 | 0 |
| Soft maple | 3,438 | 3,416 | 22 | 0 | 0 | 0 | 0 | 0 |
| Red oak | 55,937 | 55,029 | 908 | 0 | 0 | 0 | 0 | 0 |
| White oak | 12,584 | 12,091 | 470 | 23 | 0 | 0 | 0 | 0 |
| Sweetgum | 1,761 | 1,749 | 12 | 0 | 0 | 0 | 0 | 0 |
| Sycamore | 4,211 | 4,184 | 27 | 0 | 0 | 0 | 0 | 0 |
| Black walnut | 1,485 | 1,217 | 180 | 49 | 33 | 0 | 0 | 6 |
| Yellow poplar | 16,480 | 15,885 | 595 | 0 | 0 | 0 | 0 | 0 |
| Other hardwoods | 313 | 313 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 136,939 | 133,961 | 2,846 | 72 | 33 | 14 | 7 | 6 |
| All species | 137,269 | 134,291 | 2,846 | 72 | 33 | 14 | 7 | 6 |

(Table 8 continued on next page)

(Table 8 continued)

UPLAND FLATS UNIT

| Species | All States | Indiana | Kentucky | Ohio | New York | Penna. | W. Virginia | Illinois |
|---|---|---|---|---|---|---|---|---|
| Ash | 1,196 | 1,147 | 21 | 28 | 0 | 0 | 0 | 0 |
| Basswood | 205 | 205 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beech | 975 | 975 | 0 | 0 | 0 | 0 | 0 | 0 |
| Birch | 172 | 172 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 352 | 352 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black cherry | 497 | 486 | 4 | 7 | 0 | 0 | 0 | 0 |
| Cottonwood | 1,240 | 1,240 | 0 | 0 | 0 | 0 | 0 | 0 |
| Elm | 216 | 214 | 1 | 1 | 0 | 0 | 0 | 0 |
| Other hickory | 1,925 | 1,921 | 1 | 3 | 0 | 0 | 0 | 0 |
| Hard maple | 624 | 624 | 0 | 0 | 0 | 0 | 0 | 0 |
| Soft maple | 916 | 916 | 0 | 0 | 0 | 0 | 0 | 0 |
| Red oak | 7,079 | 7,006 | 22 | 51 | 0 | 0 | 0 | 0 |
| White oak | 1,320 | 1,300 | 10 | 10 | 0 | 0 | 0 | 0 |
| Sweetgum | 603 | 603 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sycamore | 1,872 | 1,872 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black walnut | 2,019 | 899 | 436 | 203 | 155 | 149 | 91 | 86 |
| Yellow poplar | 2,463 | 2,461 | 1 | 1 | 0 | 0 | 0 | 0 |
| Other hardwoods | 42 | 39 | 0 | 0 | 0 | 0 | 3 | 0 |
| All species | 23,716 | 22,432 | 496 | 304 | 155 | 149 | 94 | 86 |

(Table 8 continued on next page)

(Table 8 continued)

| Species | All States | Indiana | Michigan | Illinois | Ohio | Iowa | Kentucky | Missouri | Wisconsin | Other |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  | NORTHERN UNIT |  |  |  |  |  |  |  |  |
| Ash | 8,485 | 7,874 | 454 | 1 | 156 | 0 | 0 | 0 | 0 | 0 |
| Aspen | 28 | 27 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Basswood | 3,565 | 3,374 | 167 | 0 | 24 | 0 | 0 | 0 | 0 | 0 |
| Beech | 4,552 | 4,240 | 273 | 0 | 39 | 0 | 0 | 0 | 0 | 0 |
| Birch | 21 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 275 | 275 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black cherry | 2,279 | 1,992 | 270 | 0 | 17 | 0 | 0 | 0 | 0 | 0 |
| Cottonwood | 5,083 | 5,064 | 17 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Elm | 644 | 599 | 38 | 0 | 7 | 0 | 0 | 0 | 0 | 0 |
| Pecan | 138 | 138 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other hickory | 4,713 | 4,491 | 180 | 0 | 38 | 0 | 0 | 0 | 4 | 0 |
| Hard maple | 13,453 | 12,495 | 844 | 0 | 114 | 0 | 0 | 0 | 0 | 0 |
| Soft maple | 6,781 | 6,037 | 639 | 0 | 105 | 0 | 0 | 0 | 0 | 0 |
| Red oak | 35,153 | 33,244 | 1,661 | 0 | 178 | 0 | 69 | 0 | 1 | 0 |
| White oak | 17,827 | 17,008 | 423 | 15 | 188 | 0 | 158 | 0 | 0 | 35 |
| Sweetgum | 262 | 262 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sycamore | 4,724 | 4,619 | 73 | 0 | 32 | 0 | 0 | 0 | 0 | 0 |
| Black walnut | 7,744 | 4,684 | 223 | 1,320 | 254 | 752 | 97 | 187 | 165 | 62 |
| Yellow poplar | 6,373 | 6,049 | 309 | 0 | 15 | 0 | 0 | 0 | 0 | 0 |
| Other hardwoods | 1,047 | 974 | 40 | 0 | 33 | 0 | 0 | 0 | 0 | 0 |
| All species | 123,147 | 113,467 | 5,612 | 1,336 | 1,202 | 752 | 324 | 187 | 170 | 97 |

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[1] International 1/4-inch rule.

Table 9.--Pulpwood production in Indiana by species groups, 1965, 1970, 1975, and 1980

(In standard cords, unpeeled)

| Species Group | 1965 | 1970 | 1975 | 1980 |
|---|---|---|---|---|
| ROUNDWOOD | | | | |
| Softwoods | 655 | 9 | 0 | 1400 |
| Soft hardwoods | 46,522 | 31,367 | 14,234 | 13,616 |
| Hard hardwoods | 35,000 | 55,510 | 23,476 | 25,258 |
| Total | 82,177 | 86,886 | 37,710 | 40,274 |
| RESIDUE | | | | |
| Softwood | 0 | 0 | 0 | 0 |
| Hardwood | 3,931 | 60,904 | 97,244 | 137,660 |
| All material | 86,108 | 147,790 | 134,954 | 177,934 |

## Table 10.--Pulpwood production by species and Unit in Indiana, 1980

(In standard cords, unpeeled)

| Species | All Units | Lower Wabash Unit | Knobs Unit | Upland Flats Unit | Northern Unit |
|---|---|---|---|---|---|
| ROUNDWOOD [1] | | | | | |
| Pine | 1,400 | 0 | 0 | 0 | 1,400 |
| Ash | 2,071 | 658 | 934 | 356 | 123 |
| Aspen | 363 | 71 | 186 | 27 | 79 |
| Basswood | 479 | 99 | 264 | 17 | 99 |
| Beech | 1,771 | 114 | 1,126 | 480 | 51 |
| Blackgum | 678 | 198 | 460 | 20 | 0 |
| Black cherry | 788 | 133 | 487 | 42 | 126 |
| Cottonwood | 828 | 244 | 257 | 11 | 316 |
| Elm | 589 | 207 | 308 | 13 | 61 |
| Hard maple | 3,724 | 588 | 2,074 | 938 | 124 |
| Soft maple | 2,147 | 1,261 | 496 | 130 | 260 |
| Red oak | 8,730 | 1,997 | 5,327 | 1,143 | 263 |
| White oak | 8,962 | 1,450 | 6,141 | 1,192 | 179 |
| Sweetgum | 965 | 388 | 499 | 78 | 0 |
| Sycamore | 2,960 | 963 | 1,741 | 30 | 226 |
| Yellow-poplar | 3,819 | 1,270 | 2,261 | 134 | 154 |
| Total | 40,274 | 9,641 | 22,561 | 4,611 | 3,461 |
| RESIDUE | | | | | |
| Softwood | 0 | 0 | 0 | 0 | 0 |
| Hardwood | 137,660 | [2] | [2] | [2] | [2] |
| All material | 177,934 | [2] | [2] | [2] | [2] |

[1] Includes chips from roundwood.

[2] Not available.

## Table 11.--Veneer log production in Indiana by species, 1966, 1970, 1976, and 1980

(In thousand board feet)[1]

| Species | 1966 | 1970 | 1976 | 1980 |
|---|---|---|---|---|
| Ash | 381 | 177 | 609 | 301 |
| Basswood | 2 | 0 | 15 | 16 |
| Black cherry | 140 | 76 | 99 | 44 |
| Cottonwood | 1,129 | 1,240 | 668 | 431 |
| Gum | 502 | 466 | 386 | 226 |
| Pecan | 732 | 288 | 354 | 354 |
| Hard maple | 1,080 | 483 | 273 | 234 |
| Soft maple | 36 | 152 | 266 | 167 |
| Red oak | 429 | 124 | 1,683 | 1,565 |
| White oak | 1,681 | 1,461 | 5,428 | 5,034 |
| Sycamore | 565 | 1,056 | 525 | 213 |
| Walnut | 6,412 | 4,294 | 3,426 | 1,231 |
| Yellow-poplar | 2,469 | 780 | 1,242 | 825 |
| Other hardwoods | 205 | 667 | 6 | 97 |
| All species | 15,763 | 11,264 | 14,980 | 10,738 |

[1] International ¼-inch rule.

## Table 12.--Veneer log production by species and state or country of destination, Indiana, 1980

(In thousand board feet)[1]

| Species | Indiana | Ohio | Kentucky | Missouri | W.Virginia | Canada | Other States | Total |
|---|---|---|---|---|---|---|---|---|
| Ash | 280 | 21 | 0 | 0 | 0 | 0 | 0 | 301 |
| Basswood | 7 | 9 | 0 | 0 | 0 | 0 | 0 | 16 |
| Beech | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 40 |
| Blackgum | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| Black cherry | 20 | 24 | 0 | 0 | 0 | 0 | 0 | 44 |
| Cottonwood | 431 | 0 | 0 | 0 | 0 | 0 | 0 | 431 |
| Elm | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 41 |
| Pecan | 337 | 11 | 6 | 0 | 0 | 0 | 0 | 354 |
| Hard maple | 200 | 34 | 0 | 0 | 0 | 0 | 0 | 234 |
| Soft maple | 167 | 0 | 0 | 0 | 0 | 0 | 0 | 167 |
| Red oak | 1,217 | 63 | 285 | 0 | 0 | 0 | 0 | 1,565 |
| White oak | 4,179 | 276 | 127 | 392 | 47 | 13 | 0 | 5,034 |
| Sweetgum | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 206 |
| Sycamore | 145 | 68 | 0 | 0 | 0 | 0 | 0 | 213 |
| Black walnut | 1,025 | 108 | 98 | 0 | 0 | 0 | 0 | 1,231 |
| Yellow poplar | 825 | 0 | 0 | 0 | 0 | 0 | 0 | 825 |
| Other hardwoods | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| All species | 9,108 | 662 | 516 | 392 | 47 | 13 | 0 | 10,738 |

[1] International ¼-inch rule.

Table 13.--Veneer log receipts in Indiana by species and state or country of origin, 1980

(In thousand board feet)[1]

| Species | All States | Indiana | Ohio | Illinois | Kentucky | Penna. | Michigan | Iowa | Oklahoma | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | |
| Pine | 373 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 373 |
| HARDWOODS | | | | | | | | | | |
| Ash | 500 | 280 | 58 | 113 | 41 | 0 | 8 | 0 | 0 | 0 |
| Basswood | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blackgum | 26 | 20 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Black cherry | 968 | 20 | 12 | 0 | 3 | 884 | 49 | 0 | 0 | 0 |
| Cottonwood | 590 | 431 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 68 |
| Elm | 313 | 33 | 5 | 1 | 13 | 0 | 15 | 0 | 0 | 246 |
| Pecan | 3,401 | 337 | 36 | 115 | 61 | 0 | 11 | 0 | 1,238 | 1,603 |
| Hard maple | 565 | 200 | 34 | 0 | 0 | 68 | 216 | 11 | 0 | 36 |
| Soft maple | 237 | 167 | 0 | 34 | 36 | 0 | 0 | 0 | 0 | 0 |
| Red oak | 4,070 | 1217 | 487 | 23 | 312 | 482 | 924 | 216 | 0 | 409 |
| White oak | 10,999 | 4,179 | 1,992 | 1,579 | 1652 | 143 | 127 | 514 | 0 | 813 |
| Sweetgum | 229 | 206 | 0 | 9 | 14 | 0 | 0 | 0 | 0 | 0 |
| Sycamore | 236 | 145 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 0 |
| Black walnut | 3,862 | 1,025 | 300 | 908 | 343 | 0 | 56 | 562 | 0 | 668 |
| Yellow poplar | 957 | 825 | 97 | 0 | 35 | 0 | 0 | 0 | 0 | 0 |
| Other hardwoods | 59 | 16 | 0 | 25 | 8 | 0 | 0 | 0 | 2 | 8 |
| Total hardwoods | 27,019 | 9,108 | 3,021 | 2,807 | 2,706 | 1,577 | 1,406 | 1,303 | 1,240 | 3,851 |
| All species | 27,392 | 9,108 | 3,021 | 2,807 | 2,706 | 1,577 | 1,406 | 1,303 | 1,240 | 4,224 |

---

[1] International 1/4-inch rule.

Table 14.--Residue produced at primary wood-using mills by type of material, type of use, and unit, Indiana, 1980

(In thousand tons green weight)

| Unit and type of use | Wood residue | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Coarse 1/ | | Fine2/ | | Bark3/ | |
| | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood |
| Lower Wabash Unit | | | | | | | | |
| Fiber products | 0 | 95.78 | 0 | 93.09 | 0 | 2.69 | 0 | 2.12 |
| Industrial fuel | 0 | 15.36 | 0 | 1.90 | 0 | 13.46 | 0 | 6.46 |
| Domestic fuel | 0 | 18.70 | 0 | 17.06 | 0 | 1.64 | 0 | 8.67 |
| Miscellaneous 4/ | 0 | 34.30 | 0 | 1.00 | 0 | 33.30 | 0 | 17.28 |
| Not used | 0 | 28.30 | 0 | 3.88 | 0 | 24.42 | 0 | 15.48 |
| Total | 0 | 192.44 | 0 | 116.93 | 0 | 75.51 | 0 | 50.01 |
| Knobs Unit | | | | | | | | |
| Fiber products | .14 | 128.84 | .09 | 126.09 | .05 | 2.75 | 0 | 6.45 |
| Industrial fuel | .62 | 58.53 | .24 | 9.81 | .38 | 48.72 | .16 | 29.26 |
| Domestic fuel | .19 | 48.74 | .18 | 45.16 | .01 | 3.58 | .06 | 18.34 |
| Miscellaneous 4/ | .01 | 34.82 | 0 | 1.35 | .01 | 33.47 | 0 | 7.46 |
| Not used | .35 | 64.62 | .16 | 19.07 | .19 | 45.55 | .09 | 25.79 |
| Total | 1.31 | 335.55 | .67 | 201.48 | .64 | 134.07 | .31 | 87.30 |
| Upland Flats Unit | | | | | | | | |
| Fiber products | 0 | 22.43 | 0 | 22.43 | 0 | 0 | 0 | .67 |
| Industrial fuel | 0 | .49 | 0 | 0 | 0 | .49 | 0 | .06 |
| Domestic fuel | 0 | 8.60 | 0 | 8.60 | 0 | 0 | 0 | 3.28 |
| Miscellaneous 4/ | 0 | 6.84 | 0 | 0 | 0 | 6.84 | 0 | 2.26 |
| Not used | 0 | 20.28 | 0 | 4.41 | 0 | 15.87 | 0 | 8.40 |
| Total | 0 | 58.64 | 0 | 35.44 | 0 | 23.20 | 0 | 14.67 |
| Northern Unit | | | | | | | | |
| Fiber products | 0 | 96.78 | 0 | 96.78 | 0 | 0 | 0 | 0 |
| Industrial fuel | .16 | 58.76 | .06 | 27.04 | .10 | 31.72 | .05 | 20.28 |
| Domestic fuel | 0 | 47.57 | 0 | 46.35 | 0 | 1.22 | 0 | 13.27 |
| Miscellaneous 4/ | 0 | 71.71 | 0 | 1.63 | 0 | 70.08 | 0 | 31.36 |
| Not used | 0 | 17.59 | 0 | 5.54 | 0 | 12.05 | 0 | 11.52 |
| Total | .16 | 292.41 | .06 | 177.34 | .10 | 115.07 | .05 | 76.43 |
| All Units | | | | | | | | |
| Fiber products | .14 | 343.83 | .09 | 338.39 | .05 | 5.44 | 0 | 9.24 |
| Industrial fuel | .78 | 133.14 | .30 | 38.75 | .48 | 94.39 | .21 | 56.06 |
| Domestic fuel | .19 | 123.61 | .18 | 117.17 | .01 | 6.44 | .06 | 43.56 |
| Miscellaneous 4/ | .01 | 147.67 | 0 | 3.98 | .01 | 143.69 | 0 | 58.36 |
| Not used | .35 | 130.79 | .16 | 32.90 | .19 | 97.89 | .09 | 61.19 |
| Total | 1.47 | 879.04 | .73 | 531.19 | .74 | 347.85 | .36 | 228.41 |

1/ Suitable for chipping such as slabs, edgings, veneer cores,etc.

2/ Not suitable for chipping such as sawdust, veneer clippings, etc.

3/ Does not include bark at pulpmills.

4/ Livestock bedding, mulch, small dimension, and specialty items.

Blyth, James E.; McGuire, Donald H.; Smith, W. Brad.
Primary forest products industry and timber use, Indiana, 1980. Resour. Bull. NC-65. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 25 p.

Discusses recent Indiana forest industry trends; timber removals for industrial roundwood in 1980; and production and receipts of saw logs, pulpwood, veneer logs, and other industrial roundwood products. Reports on associated primary mill wood and bark residue and the disposition of mill residue.

KEY WORDS: Saw logs, pulpwood, veneer logs, production, mill residue, timber removals.

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North Central
Forest Experiment
Station

Resource
Bulletin **NC-66**

# Timber Resource of Michigan's Southern Lower Peninsula, 1980

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Information contained in this report includes the most commonly used Resources Evaluation statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complex retrieval involving the services of a Resources Evaluation computer programmer. If requests for data conflict with ongoing Resources Evaluation work, requests will be scheduled so as to minimize the impact on the work unit.

Requests for unpublished information may be directed to:

Burton L. Essex
Renewable Resources Evaluation Project
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108

Phone: (612) 642-5282

Area served:Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern, South Dakota, Wisconsin.

**North Central Forest Experiment Station**
**Forest Service—U.S. Department of Agriculture**
**1992 Folwell Avenue**
**St. Paul, Minnesota 55108**
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# FOREWORD

Forest Inventory and Analysis (formerly called Forest Survey) is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Resources Evaluation work done in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1980 Southern Lower Peninsula forest inventory was begun in November 1980 and completed in May 1981. Reports on the three previous surveys of Michigan's timber resource are dated 1935, 1955, and 1966. Similar Resource Bulletins reporting statistical highlights and detailed tables on the other Survey Units in Michigan (see cover) are available. In addition to these statistical reports, a series of reports will be published that will analyze the State's timber resource.

The Michigan Department of Natural Resources contacted all primary wood-using plants in the State and information from this canvass was used to help estimate the quantity of timber products harvested in Michigan.

Aerial photos used in the Southern Lower Peninsula Forest Inventory were furnished by the Michigan Department of Natural Resources and the Huron-Manistee National Forest.

# CONTENTS

Page
Highlights .... 1
Appendix .... 2
  Accuracy of Survey .... 2
  Survey Procedures .... 2
  Comparing Michigan's Fourth Inventory with the Third Inventory .... 4
  Log Grade .... 4
  Tree Species Groups in Michigan's Southern Lower Peninsula .... 8
  Metric Equivalents of Units Used in this Report .... 8
  Definition of Terms .... 9
  Tables .... 17

# TIMBER RESOURCE OF MICHIGAN'S SOUTHERN LOWER PENINSULA, 1980

**Jerold T. Hahn**
*Principal Mensurationist*

## HIGHLIGHTS

### Forest Area

- Forest land accounted for 2.5 million acres (18 percent of the Unit's land area) in 1980, compared to 2.9 million acres (20 percent) in 1966.

- Commercial forest land occupied 2.4 million acres (97 percent of the forest land) in 1980, compared to 2.8 million acres (98 percent) in 1966—a 12 percent decline.

- Productive-reserved forest land totaled 81,000 acres in 1980, compared to 31,000 acres in 1966. Since 1966 several State recreation areas have been added that range in size from several to 3,000 acres.

- Nonindustrial private parties owned 2.2 million acres (91 percent of the commercial forest) in 1980.

- The maple-birch forest type (903,000 acres in 1980) increased from 18 percent to 37 percent of commercial forest land to become the dominant forest type, replacing oak-hickory (664,000 acres in 1980), which decreased from 36 percent to 27 percent of commercial forest land.

### Timber Volume

- The volume of growing stock in 1980 was 2.4 billion cubic feet, 26 percent greater than the 1.9 billion[1] in 1966, in spite of the 12 percent loss of commercial forest land between surveys.

- Sawtimber volume amounted to 7.9 billion board feet[2] in 1980.

- Hardwoods make up 93 percent of the growing-stock volume.

- Soft maple (398 million cubic feet), select red oak (338 million), and select white oak (309 million) contain the highest volumes, and together account for 42 percent of the growing-stock volume.

- Average growing-stock volume per acre in 1980 was 998 cubic feet (12.6 cords), compared to 692 cubic feet (8.7 cords) in 1966.

- Sixty percent of the sawtimber volume is in grade 3 saw logs.

- The volume in cull trees (rough, rotten, and short-log cull) is 149 million cubic feet; salvable dead tree volume is 31 million cubic feet.

### Stand Conditions

- Net annual growth on growing-stock trees was 88 million cubic feet in 1979, compared to 69 million in 1965.

- The net annual growth rate of growing stock was the same in 1979 as it was in 1965—3.6 percent of inventory.

- Net growth averaged 35.6 cubic feet per acre in 1979 and 23.8 cubic feet per acre in 1965.

- Annual mortality of growing stock amounted to 18 million cubic feet (0.7 percent of inventory) in 1979, compared to 15 million (0.7 percent of inventory) in 1965.

---

[1] *Published 1966 volumes were adjusted by factors derived from 1980 volume equations to make volumes for the two inventories comparable.*

[2] *International 1/4-inch rule.*

- Disease accounted for 39 percent of the mortality in 1979—chiefly diseases of aspen and elm.

- Ninety-two percent of the commercial area is capable of growing trees 51 feet and taller at age 50, and 54 percent of the area can grow trees 71 feet and taller at the same age.

## Timber Use

- Timber removals from growing stock in 1979 amounted to 37 million cubic feet (1.5 percent of inventory), compared to 45 million cubic feet (2.3 percent of inventory) in 1965.

- The oaks made up 42 percent of the 1979 removals volume, although they account for only 31 percent of the growing-stock volume.

- Output of timber products totaled 51 million cubic feet in 1978, 97 percent of which was hardwood, and 45 percent of which was saw logs.

- Wood residue from primary plants in 1978 totaled 10.8 million cubic feet only 0.3 million of which were not used.

## Biomass

- Live shrub biomass (including trees less than 1-inch in d.b.h.) was highest in the aspen forest type—3,877 pounds per acre (green weight) in 1980.

- Live tree biomass (trees greater than 1-inch in d.b.h.) totaled 138 million green tons (56 tons per acre) in 1980.

- Highest yields of live tree biomass (green weight) are in the oak-hickory forest type (73 tons per acre), the white pine type (65 tons), the maple-birch type (55 tons), and the red pine type (57 tons).

# APPENDIX

## ACCURACY OF SURVEY

Resources Evaluation information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are only estimates. A measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated growing-stock volume in the Southern Lower Peninsula Unit in 1980, 2,459.4 million cubic feet, has a sampling error of ± 2.80 percent (± 87,836 thousand cubic feet). So, the chances are 2 out of 3 that the growing-stock volume from a 100-percent inventory would fall between 2,547.2 and 2,371.6 million cubic feet (2,459.4 ± 87.8).

The following tabulation shows the combined sampling errors for the 1980 Southern Lower Peninsula Forest Inventory:

| **Item** | **Unit totals** | **Sampling error** |
|---|---|---|
| Growing stock | (Million cubic feet) | (Percent) |
| Volume | 2,459.4 | 2.80 |
| Growth | 87.8 | 3.50 |
| Removals | 37.3 | 15.50 |
| Sawtimber | (Million board feet) | |
| Volume | 7,945.5 | 3.65 |
| Growth | 332.3 | 5.18 |
| Removals | 174.1 | 16.50 |
| Commercial forest land | (Thousand acres) | |
| Area | 2,463.4 | 1.56 |

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for growing-stock volume in a particular county is higher than that for total growing-stock volume in the Survey Unit (table 74 shows the sampling errors for estimates smaller than Unit totals).

## SURVEY PROCEDURES

The major steps in the survey of the Southern Lower Peninsula Unit were as follows:

1. A total of 76,960 1-acre points were systematically distributed across aerial photos of the entire Unit, except the Huron-Manistee National Forest. These points were classified into land classes, in order to make a preliminary estimate of forest area. Next, a total of 14,450 of these points were stereoclassified as to forest type, stand-size class, and density. Finally, a total of 4,022 points were examined on the ground to correct the preliminary area estimate for classification errors and for actual land use changes since the photos were taken.

| | Photo points | | Ground plots visited |
|---|---|---|---|
| | Classified | Stereoclassified | |
| Forest land | 14,184 | 14,184 | 709 |
| Unproductive forest land | 1 | 1 | 1 |
| Nonforest land | | | |
| With trees | 1,973 | 82 | 87 |
| Without trees | 59,235 | 0 | 3,135 |
| Water | 1,384 | 0 | 68 |
| Questionable | 183 | 183 | 22 |
| Total | 76,960 | 14,455 | 4,022 |

At each of the forest ground plot locations, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre. Tree measurements made at these locations and at 162 plots established in 1966 and remeasured in 1980 were the basis for estimates of timber volume, growth, mortality, number of trees, and other forest classifications on land other than National Forest land. Estimates for National Forest land were based on a portion of the 155 plots established in 1976 on commercial forest land on the Manistee National Forest.

2. Growth and mortality on all commercial forest land were estimated using the Stand and Tree Evaluation and Modeling System (STEMS)[3] after the System was adjusted with factors derived from the remeasurement in 1979 and 1980 of permanent sample plots in the Lower Peninsula that were initially established in 1965. STEMS is an individual tree-growth projection system that uses the following stand and tree characteristics to "grow" trees by updating tree diameter and tree status (live, dead, or cut): species, tree diameter, crown ratio, site index, basal area, and average stand diameter. These characteristics were used to produce growth and mortality rates that were adjusted based on ground conditions gained from remeasurement of plots and applied to trees on the tree list to yield an updated tree list. Local volume equations were applied to the original and updated tree lists to estimate volumes of growth and mortality.

3. Under an agreement with the Huron-Manistee National Forest, North Central Station crews established 10-point variable radius plots on the Huron-Manistee Forest in 1976. The Huron-Manistee National Forest provided the Station with the area of commercial forest land by forest type, stand-size class, and density for the Forest, and the Station computed all area and volume data in the same manner non-National Forest data were computed. Area and volume tables were then approved by the Huron-Manistee National Forest staff.

4. Statistics on timber utilization during 1978 were obtained from mill surveys. The Michigan Department of Natural Resources canvassed residential sawmills, veneer mills, and other primary wood-using plants. The North Central Forest Experiment Station canvassed out-of-state sawmills, pulpmills, and veneer mills to determine their use of timber from Michigan. Fuelwood and fencepost output was based on a sample of public and private landowners to determine their production of fuelwood and fenceposts, and on a canvass of industrial and public timber owners. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Michigan primary wood-using plants. Timber cut for products by ownership class was determined by a canvass of public and industrial timber owners. The portion of timber cut accounted for by the latter owners was grouped under "farmer and other owners".

5. A total of 2,239 felled trees on 123 active logging operations were measured throughout the State during 1977-1978 to develop wood utilization factors for converting timber products output to timver remocals for saw logs and pulpwood. Factors for all other products were obtained during the 1964-1965 Michigan untilization study.

6. Field data were sent to St. Paul for compiliation.

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[3] *For more information on STEMS, see: Belcher, D. L.; Holdaway, M. R.; Brand, G. J. A description of STEMS: The stand and tree evaluation and modeling system. Gen. Tech. Rep. NC-79. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; (In prep.) p.*

# COMPARING MICHIGAN'S FOURTH INVENTORY WITH THE THIRD INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for each Forest Survey Unit in Michigan to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

## Identifying and Correcting Definitional or Procedural Changes

In Michigan's Southern Lower Peninsula Unit definitional or procedural changes between the 1966 and 1980 inventories included changes in definitions of ownership classes and productive-reserved forest land and in procedures for determining the area of nonforest land by land class, the number of trees by 2-inch diameter class, and the volume equations.

In 1966, State Forest was a separate owner class and included only land on State Forests. Other forested State-owned land was included under the Other Public ownership class. In 1980, the State owner class included all State land. However, State-owned commercial forest land outside the State Forest areas is small in the Northern Lower Peninsula and general comparisons may be made between the 1966 and 1980 State estimates.

Some mining companies were called diversified forest industry in 1966 and classed under the Forest Industry ownership class. In 1980 these companies were classed under Miscellaneous Private Corporation ownership class. Therefore, a comparison of statistics for Forest Industry owner between 1966 and 1980 is only possible if you combine the Forest Industry and Miscellaneous Private Corporation ownerships in 1980.

During the 1966 Forest Inventory, Christmas tree plantations were classified as commercial forest land whereas they are now classified as productive-reserved forest land. The 1966 commercial forest and productive-reserved areas were adjusted so that they are comparable to 1980 estimates.

In the 1966 Forest Inventory, the 1964 Census of Agriculture estimates of cropland and pasture and rangeland areas were used in our inventory report tables. The 1980 inventory estimates of cropland and pasture and rangeland come from aerial photointerpretation done by Resources Evaluation personnel in St. Paul. The published 1966 estimates of cropland and pasture and rangeland areas were adjusted to be compatible with 1980 estimates.

The procedures used to determine the number of growing-stock trees by species group and 2-inch diameter class have improved between the 1966 and 1980 forest inventories. The procedure used in 1966 over-estimated the number of growing-stock trees, especially in the lower diameter classes. Adjustments were made in the 1966 estimates of number of trees so that differences between 1966 and 1980 represent actual changes in the resource, not changes in procedures. Additional adjustments were made in the 1966 number of growing-stock trees to reflect the transfer of Christmas tree plantations to productive-reserved forest land.

The volume equations used in 1980 gave more accurate estimates of tree volume than those used in 1966. Therefore, the 1966 volumes were adjusted by factors derived from the 1980 volume equations to make them comparable to 1980 volumes.

# LOG GRADE

In Michigan's Southern Lower Peninsula the butt log of every sawtimber tree on every full permanent sample plot was graded for quality. Additionally, all of the logs in a smaller sample of trees throughout the State (2,239 trees) were graded. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire Unit.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber."[4] The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

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[4] *Vaughn, C. L.; Wollin, C. A.; McDonald, K. A.; Bulgrin, E. H. Hardwood log grades for standard lumber. Res. Pap. FPL 63. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory; 1966. 52 p.*

# Forest Service standard grades for hardwood factory saw logs

| Grading factors | | Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Log grade 1 | | | Log grade 2 | | | | Log grade 3 |
| Position in tree | | Butts only | Butts and uppers | | Butts and uppers | | | | Butts and uppers |
| Scaling diameter, inches | | [1]13-15 | 16-19 | 20 + | [2]11 + | 12 + | | | 8 + |
| Length without trim, feet | | 10 + | | | 10 + | 8-9 | 10-11 | 12 + | 8 + |
| Required clear cuttings[3] of each of three best faces[4] | Min. length, feet | 7 | 5 | 3 | 3 | 3 | 3 | 3 | 2 |
| | Max. + number | 2 | 2 | 2 | 2 | 2 | 2 | 3 | No Limit |
| | Min. proportion of log length required in clear cutting | 5/6 | 5/6 | 5/6 | 2/3 | 3/4 | 2/3 | 2/3 | 1/2 |
| Maximum sweep and crook allowance | For logs with less than one-fourth of end in sound defects | 15 percent | | | 30 percent | | | | 50 percent |
| | For logs with more than one-fourth of end in sound defects | 10 percent | | | 20 percent | | | | 35 percent |
| Maximum scaling deduction | | 40 percent[5] | | | 50 percent[6] | | | | 50 percent |

[1] Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.
[2] Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.
[3] A clear cutting is a portion of a face, extending the width of the face, that is free of defects.
[4] A face is one-fourth of the surface of the log as divided lengthwise.
[5] Otherwise #1 logs with 41-60 percent deductions can be #2.
[6] Otherwise #2 logs with 51-60 percent deductions can be #3.

# Forest Service standard specifications for hardwood construction logs (tie and timber logs)[1]

| | | |
|---|---|---|
| Position in tree | | Butt and upper |
| Min. diameter, small end | | 8 inches + |
| Min. length, without trim | | 8 feet |
| Clear cuttings | | No requirements. |
| Sweep allowance, absolute | | One-fourth of the diameter at the small end for each 8 feet of length. |
| Sound surface defects | Single knots | Any number, if no one knot has an average diameter above the callus in excess of one-third of the log diameter at point of occurrence. |
| | Whorled knots | Any number if sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence. |
| | Holes | Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber.[2] |
| Unsound surface defects | | Same requirements as for sound defects if they extend into included timber.[2] No limit if they do not. |
| End defects | Sound | No requirements. |
| | Unsound | None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit a longitudinal split not extending more than 5 inches into the contained timber. |

[1] These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, it may be necessary to subdivide the class into grades.

[2] Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications on the following page.

# Log Grades for Eastern White Pine

| Log grade | Minimum size |  | Sweep or crook allowance | Total cull allowance including sweep | Maximum weevil injury | Allowable knot size (inches)[2] on three best faces or minimum clearness on four faces |
|---|---|---|---|---|---|---|
|  | Diameter | Length[1] |  |  |  |  |
|  | *(Inches)* | *(Feet)* | *(Percent)* |  | *(Number)* | *(Inches)* |
| 1 | 12 & 13 | 8-16 | 20 | 50 | 0 | Four faces clear full length |
|  | 14 + | 10-16 | 20 | 50 | 0 | Two faces clear full length, or four faces clear 50 percent length (6 foot min. length)[3] |
| 2 | 6 + | 8-16 | 30 | 50 | 0 | Sound knots 1.e[4]<br>D/6 and less than 3 inches.[5]<br>Unsound knots: 1.e. 1½ inches and for: butt, lots 1.e. D/12, upper logs 1.e.D/10, or four faces clear 50 percent of length |
| 3 | 6 + | 8-16 | 40 | 50 | 8-foot logs 1 weevil<br>10-foot + logs: 2 weevils | Sound knots 1.e.D/3 and less than 5 inches.<br>Unsound knots 1.e. D/6 and less than 2½ inches. |
| 4 | 6 + | 8-16 | 50 | 50 | No limit | No limit |

[1] Plus trim.

[2] Disregard all knots less than inch diameter in all grades.

[3] The sum of the diameter of sound knots plus twice the sum of the diameter of unsound knots (in inches) is less than or equal to half of the diameter of the log (inches).

[4] l.e. means less than or equal to.

[5] D means d.i.b. of log at location of knot.

# Log Grades for Jack Pine and Red Pine

*Grade 1:* logs with three or four clear faces.[5]

*Grade 2:* logs with one or two clear faces.

*Grade 3:* logs with no clear faces.

After the tentative log grade is established, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one third the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log one grade if conk, massed hyphae, or other evidence of advanced heart rot is found anywhere in it.

# Log Grades For All Other Softwood Logs

**Grade 1**

1. Logs must be 16 inches in diameter or larger, 10 feet in length or longer, and have not more than 30 percent of gross scale deducted for defect.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not more than 2-inches in size.

**Grade 2**

1. Logs must be 12 inches in diameter or larger, 10 feet in length or longer, and have a net scale of at least 50 percent of the gross contents of the log after deduction for defect.
2. Logs must be at least 50 percent clear on each of three faces or 5 percent clear on two faces.

**Grade 3**

1. Logs must be 6 inches in diameter or larger, 8 feet in length or longer, and have a net scale of at least 50 percent of the gross contents of the log after deduction for defect.

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[5] *A face is one fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than ½-inch in diameter, overgrown knots of any size, holes more than ¼-inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.*

Note: (A) Diameters are diameter inside bark (d.i.b.) at small end of log.
(B) Percent clear refers to percent clear in one continuous section.

## TREE SPECIES GROUPS IN MICHIGAN'S SOUTHERN LOWER PENINSULA UNIT[6]

| | |
|---|---|
| SOFTWOODS | |
| Eastern white pine | *Pinus strobus* |
| Red pine | *Pinus resinosa* |
| Jack pine | *Pinus banksiana* |
| White spruce | *Picea glauca* |
| Black spruce | *Picea mariana* |
| Balsam fir | *Abies balsamea* |
| Eastern hemlock | *Tsuga canadensis* |
| Tamarack | *Larix laricina* |
| Northern white-cedar | *Thuja occidentalis* |
| OTHER SOFTWOODS | |
| Eastern redcedar | *Juniperus virginiana* |
| Austrian pine | *Pinus nigra* |
| Scotch pine | *Pinus sylvestris* |
| HARDWOODS | |
| White oaks | |
| White oak | *Quercus alba* |
| Swamp white oak | *Quercus bicolor* |
| Bur oak | *Quercus macrocarpa* |
| Chinkapin oak | *Quercus muehlenbergii* |
| Select red oak | |
| Northern red oak | *Quercus rubra* |
| Other red oaks | |
| Scarlet oak | *Quercus coccinea* |
| Northern pin oak | *Quercus ellipsoidalis* |
| Pin oak | *Quercus palustris* |
| Black oak | *Quercus velutina* |
| Hickories | |
| Bitternut hickory | *Carya cordiformis* |
| Pignut hickory | *Carya glabra* |
| Shellbark hickory | *Carya laciniosa* |
| Shagbark hickory | *Carya ovata* |
| Mockernut hickory | *Carya tomentosa* |
| Yellow birch | *Betula alleghaniensis* |
| Hard maples | |
| Sugar maple | *Acer saccharum* |
| Black maple | *Acer nigrum* |
| Soft maples | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| American beech | *Fagus grandifolia* |
| Ashes | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Balsam poplar | *Populus balsamifera* |
| Eastern Cottonwood | *Populus deltoides* |
| Aspens | |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| Basswood | *Tilia americana* |
| Yellow poplar | *Liriodendron tulipifera* |
| Black walnut | *Juglans nigra* |
| Black cherry | *Prunus serotina* |
| Butternut | *Juglans cinerea* |
| Elms | |
| American elm | *Ulmus americana* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomassii* |
| Paper birch | *Betula papyrifera* |
| OTHER HARDWOODS | |
| Boxelder | *Acer negundo* |
| River birch | *Betula nigra* |
| Black willow | *Salix nigra* |
| Ohio buckeye | *Aesculus glabra* |
| Flowering dogwood | *Cornus florida* |
| Honey locust | *Gleditsia triacanthos* |
| Osage-orange | *Maclura pomifera* |
| Black tupelo | *Nyssa sylvatica* var. sylvatica |
| Sycamore | *Platanus occidentalis* |
| Black locust | *Robinia psuedoacacia* |
| Sassafras | *Sassafras albidum* |

## METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International ¼-inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilogram.
1 ton = 0.907 metric ton.

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[6] *The common and scientific names are based on, Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handbk. 541. Washington, D.C.: U.S. Department of Agriculture, Forest Service, 1979. 375 p.*

# DEFINITION OF TERMS

**Acceptable trees.**—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

**Area-condition classes.**—*Class 10.*—Areas fully stocked with desirable trees but not overstocked.

*Class 20.*—Areas fully stocked with desirable trees but overstocked with all live trees.

*Class 30.*—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

*Class 40.*—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

*Class 50.*—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

*Class 60.*—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

*Class 70.*—Areas poorly stocked with desirable trees and poorly stocked with growing-stock trees.

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Biomass.**—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of 5 components:

*Growing-stock bole.*—Biomass of a growing-stock tree from a 1-foot stump to a variable 4-inch top.

*Growing-stock tops and limbs.*—Biomass of a growing-stock tree from a 1-foot stump minus the growing-stock bole.

*Cull bole.*—Biomass of a cull tree from a 1-foot stump to a variable 4-inch top.

*Cull tops and limbs.*—Biomass of a cull tree from a 1-inch stump minus the cull bole.

*1- to 5-inch trees.*—Biomass of all live trees 1- to 5-inches in diameter at breast height.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

**County and municipal land.**—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

**Cull.**—Portions of a tree that are unusable for industrial wood products, because of rot, form, or other defect.

**Desirable trees.**—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

**Diameter classes.**—A classification of trees based on diameter outside bark, measured at breast height (4- feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Survey, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h. inclusive).

**Farm.**—Either a place operated as a unit of 10 or more acres from which the sale of agricultural products totals $50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least $250. Places having less than the $50 or $250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce goods in sufficient quantity to meet the requirements of the definition.

**Farmer-owned land.**—Land owned by farm operators. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest trees.**—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

**Forest type.**—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Michigan are:

*Jack pine.*—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

*Red pine.*—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

*White pine.*—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

*Balsam fir.*—Forests in which balsam fir and white spruce comprise a plurality of stocking with balsam fir the most common. (Common associates include white spruce, aspen, maple, birch, northern white-cedar, and tamarack.)

*White spruce.*—Forests in which white spruce and balsam fir comprise a plurality of the stocking with white spruce the most common. (Common associates include balsam fir, aspen, maple, birch, northern white-cedar, and tamarack.)

*Black spruce.*—Forests in which swamp conifers comprise a plurality of the stocking with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

*Northern white-cedar.*—Forests in which swamp conifers comprise a plurality of the stocking with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

*Tamarack.*—Forests in which swamp conifers comprise a plurality of the stocking with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

*Oak-hickory.*—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, beech, yellow-poplar, elm, and maple.)

*Elm-ash-soft maple.*—Forests in which lowland elm, ash, cottonwood, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include birches, spruce, and balsam fir.)

*Maple-birch.*—Forests in which sugar maple, basswood, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, hemlock, and basswood.)

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

*Paper birch.*—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

*Exotic.*—Forests in which species not native to Michigan comprise a plurality of the stocking. (Mostly scotch pine plantations.)

**Gross area.**—The entire area of land and water as determined by the Bureau of the Census, 1970.

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by multiplying by 79 cubic feet per solid wood cord.

**Hardwoods.**—Dicotyledonous trees, usually broad-leaved and deciduous.

**Idle farmland.**—Includes former croplands, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

**Improved pasture.**—Land currently improved for grazing, by cultivation, seeding, irrigation, or clearing of trees or brush and less than 16.7 percent stocked with live trees.

**Indian land.**—Tribal lands held in fee but administered by the Federal Government.

**Land area.**—A. *Bureau of the Census.* The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Survey.* The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Live trees.**—Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

**Log grades.**—A classification of logs based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

**Logging residues.**—The unused growing stock portions of trees cut or killed by logging.

**Maintained road.**—Any road, hard-topped or other surfaces, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

**Marsh.**—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

**Merchantable.**—Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

**Miscellaneous Federal land.**—Federal land other than National Forest, and land administered by the Bureau of Land Management.

**Miscellaneous private land.**—Privately owned land other than forest-industry and farmer-owned land.

**Mortality.**—The volume of sound wood in growing-stock and sawtimber trees that die annually.

**National Forest land.**—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

**Net annual growth of growing-stock.**— The annual change in volume of sound wood in live-sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

**Net annual growth of sawtimber.**—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

**Net volume.**—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land.

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area, to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Other removals.**—Growing-stock trees removed but not utilized for products, or trees left standing but "removed" from the commercial forest land classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

**Ownership.**—Property owned by one owner, regardless of the number of parcels in a specified area.

**Ownership size class.**—The amount of commercial forest land owned by one owner, regardless of the number or parcels.

**Owner tenure.**—The length of time a property has been held by the owner.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Resources Evaluation inventories are:

*Xeric sites.*—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

**Plant byproducts.**—Plant residues used for products such as mulch, pulp chips, and fuelwood.

**Plant residues.**—Wood and bark materials generated at manufacturing plants during production of other products.

**Poletimber stands.**—(See stand-size class.)

**Poletimber trees.**—Growing-stock trees of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten trees.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough trees.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Roundwood products.**—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs, veneer logs and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

**Salvable dead trees.**—Standing or down dead trees that are considered merchantable by Regional standards.

**Saplings.**—Live trees 1.0 to 5.0 inches d.b.h.

**Sapling-seedling stands.**—(See stand-size class.)

**Saw log.**—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by Regional standards.

**Saw log portion.**—That part of the bole of sawtimber trees between the stump and the saw log top.

**Saw log top.**—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

**Sawtimber stands.**—(See stand-size class.)

**Sawtimber trees.**—Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting Regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

**Sawtimber volume.**—Net volume of the saw log portion of live sawtimber in board feet, International inch rule, from stump to a minimum 7 inches top diameter outside bark (d.o.b.) for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

**Seedlings.**—Live trees less than 1.0 inch d.b.h. that areexpected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Short-log (rough tree).**—Sawtimber-size trees of commercial species that contain at least one merchantable 8-to 11-foot saw log but not a 12-foot saw log.

**Shrub biomass.**—The total above-ground weight (including the bark) of selected shrubs and trees less than 1 inch d.b.h.

**Site class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-area class.**—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

**Stand-size class.**—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings.

a. *Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

b. *Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

c. *Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

d. *Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

**State land.**—Land owned by States, or land leased to these governmental units for 50 years or more.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Timber removals from growing stock.**—The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals.

**Timber removals from sawtimber.**—The net board-foot volume of live sawtimber trees removed for forest products annually (including roundwood products and logging residues) and for other removals.

**Timber products output.**—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

**Tree biomass.**—The total aboveground weight (including the bark) of all trees 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark) from a 1-foot stump for trees more than 5 inches in diameter.

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

**Upper stem portion.**—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

**Urban and other areas.**—Areas within the legal boundaries of cities andtowns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards, cemeteries, roads; railroads; airports; beaches; powerlines; and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

**Wooded strip.**—An acre or more of natural continuous forest land that would otherwise meet survey standards for commercial forest land except that it is less than 120 feet wide.

# TABLES

## AREA

Table 1.—Area of land by land class, 1966 and 1980

Table 2.—Area of land by land use class and county

Table 3.—Area of commercial forest land by ownership class and county

Table 4.—Area of commercial forest land by forest type, physiographic class, and ownership class

Table 5.—Area of commercial forest land by ownership class and site class

Table 6.—Area of commercial forest land by ownership class and stand-volume class

Table 7.—Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner

Table 8.—Area of commercial forest land by forest type, stand-size class, and ownership class

Table 9.—Area of commercial forest land by forest type and county

Table 10.—Area of commercial forest land by county and stand-size class

Table 11.—Area of commercial forest land by forest type, stand-size class, and site class

Table 12.—Area of commercial forest land by forest type and stand-age class

Table 13.—Area of commercial forest land by forest type and site-index class

Table 14.—Area of commercial forest land by forest type, stand-size class, and basal-area class

Table 15.—Area of commercial forest land by stocking class of growing-stock trees and stand-size class

Table 16.—Area of commercial forest land by stocking class based on selected stand components

Table 17.—Area of noncommercial forest land by ownership class

Table 18.—Area of noncommercial forest land by forest type

Table 19.—Area of nonforest land with trees by forest type and land use

## NUMBER OF TREES

Table 20.—Number of all live trees on commercial forest land by species group and diameter class

Table 21.—Number of growing-stock trees on commercial forest land by species group and diameter class

Table 22.—Number of short-log trees on commercial forest land by species group and diameter class

## VOLUME

Table 23.—Net volume of growing stock on commercial forest land by species, 1966 and 1980

Table 24.—Net volume of all live trees on commercial forest land by species group and diameter class

Table 25.—Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods

Table 26.—Net volume of growing-stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species.

Table 27.—Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species

Table 28.—Net volume of growing stock on commercial forest land by county and species group

Table 29.—Net volume of sawtimber on commercial forest land by county and species group

Table 30.—Net volume of growing stock on commercial forest land by species group and diameter class

Table 31.—Net volume of sawtimber on commercial forest land by species group and diameter class

Table 32.—Net volume of growing stock on commercial forest land by species group and forest type

Table 33.—Net volume of sawtimber on commercial forest land by species group and forest type

Table 34.—Net volume of growing stock on commercial forest land by species group and ownership class

Table 35.—Net volume of sawtimber on commercial forest land by species group and ownership class

Table 36.—Net volume of growing stock on commercial forest land by forest type and stand-age class

Table 37.—Net volume of sawtimber on commercial forest land by forest type and stand-age class

Table 38.—Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 39.—Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 40.—Net volume of sawtimber on commercial forest land by species group and log-grade class

Table 41.—Net volume of short-log trees on commercial forest land by species group and diameter class

Table 42.—Net volume of short-log trees on commercial forest land by species group and diameter class

## GROWTH AND REMOVALS

Table 43.—Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, 1965-1979

Table 44.—Net annual growth of growing stock on commercial forest land by species group and county

Table 45.—Net annual growth of sawtimber on commercial forest land by species group and county

Table 46.—Net annual growth of growing stock on commercial forest land by species group and ownership class

Table 47.—Net annual growth of sawtimber on commercial forest land by species group and ownership class

Table 48.—Net annual growth of growing stock on commercial forest land by species group and forest type

Table 49.—Net annual growth of sawtimber on commercial forest land by species group and forest type

Table 50.—Net annual growth of growing stock on commercial forest land by forest type and stand-age class

Table 51.—Net annual growth of sawtimber on commercial forest land by forest type and stand-age class

Table 52.—Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 53.—Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 54.—Timber removals from growing-stock on commercial forest land by species group and county

Table 55.— Timber removals from sawtimber on commercial forest land by species group and county

Table 56.—Timber removals from growing stock and sawtimber on commercial forest land by species group, 1965 and 1979

Table 57.—Timber removals from growing stock and sawtimber on commercial forest land by item and species category

Table 58.— Net annual growth and removals of growing stock on commercial forest land by species group

Table 59.—Net annual growth and removals of sawtimber on commercial forest land by species group

Table 60.— Net annual growth and removals of growing stock on commercial forest land by ownership class and softwoods and hardwoods

Table 61.—Net annual growth and removals of sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## MORTALITY

Table 62.—Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, 1965 and 1979

Table 63.—Annual mortality of growing stock on commercial forest land by species group and cause

Table 64.—Annual mortality of sawtimber on commercial forest land by species group and cause

Table 65.—Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## UTILIZATION

Table 66.—Output of timber products by source of material and softwoods and hardwoods

Table 67.—Output of roundwood products by source of material and softwoods and hardwoods

Table 68.—Timber products from roundwood by species group and product

Table 69.—Volume of primary plant residue by use and type

## BIOMASS

Table 70.—All live shrub biomass yields on commercial forest land by shrub species group and forest type

Table 71.—All live tree biomass yields on commercial forest land by speciesgroup and forest type

Table 72.—All live tree biomass on commercial forest land by species group and forest type

Table 73.—All live tree biomass by species group and tree biomass component

## SAMPLING ERRORS

Table 74.—Sampling errors for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land

Table 1.--Area of land by land class, Southern Lower Peninsula, Michigan, 1966[1] and 1980

(In thousand acres)

| Land class | 1966[1] | 1980 |
|---|---|---|
| FOREST LAND | | |
| Commercial forest | | |
| Jack pine | 12.3 | 12.6 |
| Red pine | 36.5 | 31.5 |
| White pine | 17.6 | 21.5 |
| Balsam fir-white spruce | 16.1 | 7.5 |
| Black spruce | -- | -- |
| Northern white-cedar | 10.1 | 13.0 |
| Tamarack | 20.5 | 4.4 |
| Oak-hickory | 1,016.5 | 663.6 |
| Elm-ash-soft maple | 719.4 | 548.6 |
| Maple-birch | 501.6 | 903.3 |
| Aspen | 405.7 | 184.4 |
| Paper birch | 23.7 | 6.6 |
| Exotic | 32.2 | 26.3 |
| Nonstocked | -- | 40.1 |
| Subtotal | 2,812.2 | 2,463.4 |
| Noncommercial forest land | | |
| Unproductive | 14.0 | 4.9 |
| Productive-reserved | 30.9 | 80.8 |
| Subtotal | 44.9 | 85.7 |
| Total | 2,857.1 | 2,549.1 |
| NONFOREST LAND | | |
| Cropland | 7,188.3 | 8,997.8 |
| Pasture and range | 628.2 | 423.4 |
| Other | 3,846.7 | 2,516.5 |
| Total | 11,663.2 | 11,937.7 |
| TOTAL LAND | [2]14,520.3 | [3]14,486.8 |
| WATER (BUREAU OF THE CENSUS) | [2]166.4 | [3]199.9 |
| TOTAL LAND AND WATER | [2]14,686.7 | [3]14,686.7 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

[2] U.S. Department of Commerce, Bureau of Census. 1950.

[3] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 2.--Area of land by land use class and county, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Land use class | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Allegan | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| FOREST LAND | | | | | | | | | | | | |
| Commercial forest | 2,463.4 | 137.4 | 111.2 | 66.1 | 44.1 | 76.1 | 54.0 | 30.5 | 45.5 | 44.0 | 27.4 | 45.0 |
| Unproductive forest | 4.9 | -- | 4.3 | -- | -- | -- | -- | -- | -- | -- | -- | 0.6 |
| Productive reserved | 80.8 | -- | 4.4 | 1.2 | -- | 0.5 | -- | 0.5 | -- | -- | -- | -- |
| Total | 2,549.1 | 137.4 | 119.9 | 67.3 | 44.1 | 76.6 | 54.0 | 31.0 | 45.5 | 44.0 | 27.4 | 45.6 |
| NONFOREST LAND | | | | | | | | | | | | |
| Nonforest with trees: | | | | | | | | | | | | |
| Cropland with trees | 43.2 | -- | -- | -- | -- | -- | -- | 4.0 | -- | 4.2 | 4.6 | -- |
| Improved pasture with trees | 4.7 | 4.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Wooded strips | 182.6 | 3.4 | 4.0 | 9.6 | 4.5 | 9.4 | 10.8 | -- | -- | 9.0 | 2.7 | 17.3 |
| Idle farmland with trees | 8.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh with trees | 73.4 | 5.4 | -- | -- | -- | -- | 6.9 | -- | -- | -- | 3.3 | 1.8 |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | 28.3 | -- | 4.0 | -- | -- | -- | -- | -- | -- | -- | -- | 4.0 |
| Wooded pasture | 9.4 | -- | -- | -- | 4.5 | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 350.3 | 13.3 | 8.0 | 9.6 | 9.0 | 9.4 | 17.7 | 4.0 | -- | 13.2 | 10.6 | 23.1 |
| Nonforest without trees: | | | | | | | | | | | | |
| Cropland without trees | 8,698.6 | 268.7 | 190.9 | 175.2 | 248.2 | 260.3 | 181.4 | 323.8 | 298.5 | 250.4 | 263.0 | 251.0 |
| Improved pasture without trees | 418.7 | 46.6 | 3.6 | 14.3 | -- | 28.7 | 7.2 | -- | -- | -- | 21.5 | 14.3 |
| Idle farm without trees | 15.3 | -- | -- | -- | -- | 4.5 | 3.6 | -- | -- | -- | -- | 3.6 |
| Marsh without trees | 132.4 | -- | -- | -- | 3.6 | 7.2 | 10.8 | -- | 3.6 | -- | -- | 3.6 |
| Other farm-farmstead | 256.0 | 28.7 | 3.6 | 3.6 | 8.1 | 21.5 | 7.2 | -- | 3.6 | -- | 17.9 | 10.8 |
| Urban and other | 2,032.3 | 30.6 | 28.7 | 101.0 | 10.8 | 45.7 | 32.1 | 7.2 | 14.3 | 103.3 | 21.5 | 32.3 |
| Noncensus water | 34.1 | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 11,587.4 | 377.9 | 226.8 | 294.1 | 270.7 | 367.9 | 242.3 | 331.0 | 320.0 | 353.7 | 323.9 | 315.6 |
| Total | 11,937.7 | 391.2 | 234.8 | 303.7 | 279.7 | 377.3 | 260.0 | 335.0 | 320.0 | 366.9 | 334.5 | 338.7 |
| TOTAL LAND | [1]14,486.8 | 528.6 | 354.7 | 371.0 | 323.8 | 453.9 | 314.0 | 366.0 | 365.5 | 410.9 | 361.9 | 384.3 |
| WATER (BUREAU OF THE CENSUS) | [1]199.9 | 7.1 | 10.7 | 2.8 | 7.1 | 4.4 | 9.2 | 0.7 | 0.6 | 4.5 | 0.3 | 2.3 |
| TOTAL LAND AND WATER | [1]14,686.7 | 535.7 | 365.4 | 373.8 | 330.9 | 458.3 | 323.2 | 366.7 | 366.1 | 415.4 | 362.2 | 386.6 |

(Table 2 continued on next page)

[1] U.S. Department of Commerce, Bureau of the Census, 1970. Area Measurement Reports, GE-20, No. 1.

(Table 2 continued)

| Land use class | County<br>Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FOREST LAND | | | | | | | | | | | | |
| Commercial forest | 56.1 | 42.1 | 37.2 | 83.4 | 66.6 | 122.6 | 81.0 | 47.7 | 69.1 | 45.0 | 35.1 | 145.3 |
| Unproductive forest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Productive reserved | 1.3 | -- | 1.4 | 4.0 | 6.8 | 1.0 | 2.5 | 0.5 | 9.0 | 1.2 | 0.1 | -- |
| Total | 57.4 | 42.1 | 38.6 | 87.4 | 73.4 | 123.6 | 83.5 | 48.2 | 78.1 | 46.2 | 35.2 | 145.3 |
| NONFOREST LAND | | | | | | | | | | | | |
| Nonforest with trees: | | | | | | | | | | | | |
| Cropland with trees | -- | -- | -- | 4.0 | -- | 9.0 | 4.1 | -- | -- | -- | -- | -- |
| Improved pasture with trees | 0.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Wooded strips | -- | -- | 8.5 | 4.0 | 13.0 | -- | -- | 12.8 | -- | -- | 8.5 | -- |
| Idle farmland with trees | -- | -- | -- | -- | -- | -- | -- | -- | 4.0 | -- | -- | -- |
| Marsh with trees | 4.2 | -- | -- | 4.2 | -- | -- | 6.8 | -- | 4.2 | -- | -- | -- |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | -- | -- | -- | 4.0 | -- | -- | -- | -- | -- | 4.1 | -- | -- |
| Wooded pasture | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 4.4 | -- | 8.5 | 16.2 | 13.0 | 9.0 | 10.9 | 12.8 | 8.2 | 4.1 | 8.5 | -- |
| Nonforest without trees: | | | | | | | | | | | | |
| Cropland without trees | 444.8 | 243.2 | 284.8 | 302.4 | 138.6 | 273.2 | 286.8 | 335.5 | 217.5 | 154.2 | 233.8 | 214.1 |
| Improved pasture without trees | -- | -- | 3.6 | -- | 21.5 | 50.2 | -- | 21.5 | 7.2 | 3.6 | -- | 35.9 |
| Idle farm without trees | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Marsh without trees | 3.6 | -- | -- | 3.6 | 12.5 | -- | -- | 10.8 | 3.6 | -- | 3.6 | 15.7 |
| Other farm-farmstead | -- | -- | 7.2 | -- | 10.8 | 7.2 | -- | 7.2 | 7.2 | 3.6 | 10.8 | 14.3 |
| Urban and other | 14.0 | 72.4 | 25.1 | 37.2 | 89.7 | 78.9 | 39.6 | 39.5 | 44.2 | 92.5 | 64.6 | 22.1 |
| Noncensus water | -- | -- | -- | -- | -- | 6.4 | -- | 6.4 | -- | 3.1 | -- | 8.5 |
| Subtotal | 462.4 | 315.6 | 320.7 | 343.2 | 273.1 | 415.9 | 326.4 | 420.9 | 279.7 | 257.0 | 312.8 | 310.6 |
| Total | 466.8 | 315.6 | 329.2 | 359.4 | 286.1 | 424.9 | 337.3 | 433.7 | 287.9 | 261.1 | 321.3 | 310.6 |
| TOTAL LAND | 524.2 | 357.7 | 367.8 | 446.8 | 359.5 | 548.5 | 420.8 | 481.9 | 366.0 | 307.3 | 356.5 | 455.9 |
| WATER (BUREAU OF THE CENSUS) | 3.3 | 0.7 | 2.1 | 12.1 | 11.7 | 7.0 | 2.8 | 4.5 | 7.0 | 0.5 | 4.4 | 4.9 |
| TOTAL LAND AND WATER | 527.5 | 358.4 | 369.9 | 458.9 | 371.2 | 555.5 | 423.6 | 486.4 | 373.0 | 307.8 | 360.9 | 460.8 |

(Table 2 continued on next page)

(Table 2 continued)

| Land use class | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| FOREST LAND | | | | | | | | | | | | |
| Commercial forest | 164.6 | 82.2 | 77.5 | 82.7 | 87.9 | 59.9 | 50.1 | 52.8 | 83.7 | 102.0 | 72.0 | 35.5 |
| Unproductive forest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Productive reserved | 1.2 | 22.1 | 0.2 | -- | 1.1 | -- | 0.1 | -- | -- | 4.2 | 10.8 | 6.7 |
| Total | 165.8 | 104.3 | 77.7 | 82.7 | 89.0 | 59.9 | 50.2 | 52.8 | 83.7 | 106.2 | 82.8 | 42.2 |
| NONFOREST LAND | | | | | | | | | | | | |
| Nonforest with trees | | | | | | | | | | | | |
| Cropland with trees | -- | 4.6 | -- | -- | -- | -- | -- | -- | 4.1 | -- | 4.6 | -- |
| Improved pasture with trees | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Wooded strips | -- | 8.8 | -- | -- | 4.1 | 8.5 | 12.1 | 4.1 | 14.9 | 8.5 | 4.1 | -- |
| Idle farmland with trees | -- | 2.0 | -- | -- | -- | -- | -- | -- | -- | -- | 2.7 | -- |
| Marsh with trees | -- | 6.9 | 7.6 | -- | -- | 2.7 | 4.2 | -- | 4.2 | 11.0 | -- | -- |
| Urban and other windbreaks | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Windbreaks | -- | 4.1 | -- | -- | 4.0 | -- | 4.1 | -- | -- | -- | -- | -- |
| Wooded pasture | -- | -- | -- | -- | -- | -- | 2.2 | 2.7 | -- | -- | -- | -- |
| Subtotal | -- | 26.4 | 7.6 | -- | 8.1 | 11.2 | 22.6 | 6.8 | 23.2 | 19.5 | 11.4 | -- |
| Nonforest without trees | | | | | | | | | | | | |
| Cropland without trees | 50.8 | 126.3 | 199.8 | 328.6 | 275.6 | 191.7 | 496.4 | 260.7 | 393.1 | 186.2 | 262.3 | 86.8 |
| Improved pasture without trees | 21.5 | 25.1 | 21.5 | 3.6 | 7.2 | 17.9 | 6.3 | 3.6 | -- | 21.5 | 10.8 | -- |
| Idle farm without trees | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | -- | -- |
| Marsh without trees | 3.6 | 3.6 | 3.6 | 3.6 | 10.8 | 7.0 | 10.8 | -- | -- | 7.2 | -- | -- |
| Other farm-farmstead | 3.6 | 7.2 | 3.6 | 17.9 | 10.8 | 7.2 | 7.2 | 3.6 | 3.6 | 7.2 | 7.2 | 3.6 |
| Urban and other | 69.2 | 261.8 | 46.6 | 84.3 | 68.1 | 28.7 | 21.5 | 17.9 | 17.9 | 34.2 | 80.2 | 254.6 |
| Noncensus water | 6.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 155.1 | 424.0 | 275.1 | 438.0 | 372.5 | 252.5 | 542.2 | 285.8 | 414.6 | 259.9 | 360.5 | 345.0 |
| Total | 155.1 | 450.4 | 282.7 | 438.0 | 380.6 | 263.7 | 564.8 | 292.6 | 437.8 | 279.4 | 371.9 | 345.0 |
| TOTAL LAND | 320.9 | 554.7 | 360.4 | 520.7 | 469.6 | 323.6 | 615.0 | 345.4 | 521.5 | 385.6 | 454.7 | 387.2 |
| WATER (BUREAU OF THE CENSUS) | 11.3 | 20.8 | 5.6 | 0.3 | 11.0 | 7.9 | -- | 0.2 | 3.3 | 8.0 | 8.0 | 12.8 |
| TOTAL LAND AND WATER | 332.2 | 575.5 | 366.0 | 521.0 | 480.6 | 331.5 | 615.0 | 345.6 | 524.8 | 393.6 | 462.7 | 400.0 |

Table 3.--Area of commercial forest land by ownership class and county, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Allegen | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| National Forest | 12.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 7.6 | -- | -- | -- | -- | 4.2 | -- | -- | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| State | 149.3 | 37.1 | 23.5 | -- | -- | -- | -- | -- | -- | -- | 2.9 | -- |
| County and municipal | 52.6 | -- | -- | -- | -- | 5.1 | -- | -- | -- | 4.2 | -- | -- |
| Forest industry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Farmer | 1,150.9 | 10.1 | 45.2 | 25.0 | 44.1 | 22.2 | 21.3 | 18.8 | 40.4 | 36.9 | 8.0 | 25.9 |
| Misc. private-corp. | 140.2 | 6.7 | -- | 8.4 | -- | 4.9 | -- | -- | 2.5 | -- | 3.4 | -- |
| Misc. private-indiv. | 949.9 | 83.5 | 42.5 | 32.7 | -- | 39.7 | 32.7 | 11.7 | 2.6 | 2.9 | 13.1 | 19.1 |
| All owners | 2,463.4 | 137.4 | 111.2 | 66.1 | 44.1 | 76.1 | 54.0 | 30.5 | 45.5 | 44.0 | 27.4 | 45.0 |

(Table 3 continued)

(Table 3 continued)

| Ownership class | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
| National Forest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| State | -- | 3.3 | -- | -- | 1.5 | 5.5 | 2.6 | -- | 3.3 | -- | 2.0 | 13.6 |
| County and municipal | -- | -- | -- | -- | 5.9 | -- | -- | -- | -- | 4.7 | -- | -- |
| Forest industry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Farmer | 51.9 | 32.1 | 28.9 | 42.7 | 18.1 | 20.2 | 64.4 | 36.7 | 39.2 | 33.6 | 28.0 | 39.5 |
| Misc. private-corp. | -- | -- | -- | 3.4 | 2.1 | 18.6 | 4.9 | 5.9 | 3.4 | 6.7 | -- | 3.4 |
| Misc. private-indiv. | 4.2 | 6.7 | 8.3 | 37.3 | 39.0 | 78.3 | 9.1 | 5.1 | 23.2 | -- | 5.1 | 87.5 |
| All owners | 56.1 | 42.1 | 37.2 | 83.4 | 66.6 | 122.6 | 81.0 | 47.7 | 69.1 | 45.0 | 35.1 | 145.3 |

(Table 3 continued on next page)

(Table 3 continued)

| Ownership class | County | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
| National Forest | 11.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 3.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| State | 9.1 | -- | -- | 2.9 | 10.1 | 9.1 | -- | -- | 19.4 | -- | 3.4 | -- |
| County and municipal | 22.0 | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Forest industry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.9 |
| Farmer | 15.8 | 61.6 | 10.1 | 16.4 | 60.1 | 20.2 | 50.1 | 48.8 | 54.2 | 31.0 | 37.8 | 11.6 |
| Misc. private-corp. | 11.1 | 20.6 | 9.7 | -- | 8.5 | -- | -- | -- | -- | 4.9 | 6.9 | 4.2 |
| Misc. private-indiv. | 91.6 | -- | 52.9 | 63.4 | 9.2 | 30.6 | -- | 4.0 | 10.1 | 66.1 | 23.9 | 13.8 |
| All owners | 164.6 | 82.2 | 77.5 | 82.7 | 87.9 | 59.9 | 50.1 | 52.8 | 83.7 | 102.0 | 72.0 | 35.5 |

Table 4.--Area of commercial forest land by forest type, physiographic class, and ownership class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and physiographic class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Jack pine | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.2 |
| Mesic | 0.1 | 0.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | 8.3 | 0.2 | -- | -- | -- | 3.3 | 4.8 | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 12.6 | 0.3 | -- | -- | -- | 3.3 | 4.8 | -- | -- | -- | 4.2 |
| Red pine | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 2.6 | -- | -- | -- | -- | 2.6 | -- | -- | -- | -- | -- |
| Mesic | 20.7 | 0.1 | -- | -- | -- | 6.8 | 3.3 | -- | -- | 2.3 | 8.2 |
| Xeromesic | 8.2 | 3.3 | -- | -- | -- | 1.6 | 3.3 | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 31.5 | 3.4 | -- | -- | -- | 11.0 | 6.6 | -- | -- | 2.3 | 8.2 |
| White pine | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 19.4 | -- | -- | -- | -- | -- | -- | -- | 4.2 | -- | 15.2 |
| Xeromesic | 2.1 | -- | -- | -- | -- | -- | -- | -- | -- | 2.1 | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 21.5 | -- | -- | -- | -- | -- | -- | -- | 4.2 | 2.1 | 15.2 |
| Balsam fir | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 |

(Table 4 continued on next page)

(Table 4 continued)

| Forest type and physiographic class | All owners | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ownership class | | | | | | | | | |
| Black spruce | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 6.8 | -- | -- | -- | -- | 0.2 | -- | -- | 6.6 | -- | -- |
| Mesic | 6.2 | -- | -- | -- | -- | -- | -- | -- | 6.2 | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 13.0 | -- | -- | -- | -- | 0.2 | -- | -- | 12.8 | -- | -- |
| Tamarack | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 |
| Oak-hickory | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 79.7 | -- | -- | -- | -- | 15.5 | -- | -- | 33.3 | 6.8 | 24.1 |
| Mesic | 548.6 | 0.3 | -- | -- | -- | 37.3 | 10.0 | -- | 236.4 | 18.4 | 246.2 |
| Xeromesic | 35.3 | 7.9 | -- | -- | -- | 6.8 | 4.2 | -- | 3.3 | -- | 13.1 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 663.6 | 8.2 | -- | -- | -- | 59.6 | 14.2 | -- | 273.0 | 25.2 | 283.4 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Hydric | 68.8 | -- | -- | -- | -- | -- | -- | -- | 26.4 | 17.3 | 25.1 |
| Hydromesic | 446.0 | 0.6 | -- | 4.2 | -- | 18.4 | 10.7 | -- | 217.9 | 39.0 | 155.2 |
| Mesic | 33.8 | -- | -- | -- | -- | 3.3 | -- | -- | 28.0 | 2.5 | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 548.6 | 0.6 | -- | 4.2 | -- | 21.7 | 10.7 | -- | 272.3 | 58.8 | 180.3 |

(Table 4 continued on next page)

(Table 4 continued)

| Forest type and physiographic class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Maple-birch | | | | | | | | | | | |
| Hydric | 4.2 | -- | -- | -- | -- | -- | -- | -- | 4.2 | -- | -- |
| Hydromesic | 130.9 | -- | -- | -- | -- | -- | 11.1 | -- | 70.7 | -- | 49.1 |
| Mesic | 740.2 | 0.1 | -- | -- | -- | 29.7 | 1.8 | -- | 380.1 | 47.6 | 280.9 |
| Xeromesic | 23.8 | -- | -- | 3.4 | -- | 3.2 | -- | -- | 9.1 | -- | 8.1 |
| Xeric | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.2 |
| All classes | 903.3 | 0.1 | -- | 3.4 | -- | 32.9 | 12.9 | -- | 464.1 | 47.6 | 342.3 |
| Aspen | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 77.3 | -- | -- | -- | -- | 14.2 | 3.4 | -- | 46.3 | -- | 13.4 |
| Mesic | 106.8 | -- | -- | -- | -- | 4.4 | -- | -- | 52.5 | -- | 49.9 |
| Xeromesic | 0.3 | 0.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 184.4 | 0.3 | -- | -- | -- | 18.6 | 3.4 | -- | 98.8 | -- | 63.3 |
| Paper birch | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 6.6 | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | 3.3 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 6.6 | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | 3.3 |
| Exotic | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 21.5 | -- | -- | -- | -- | -- | -- | -- | 1.2 | 4.2 | 16.1 |
| Xeromesic | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 26.3 | -- | -- | -- | -- | -- | -- | -- | 1.2 | 4.2 | 20.9 |
| Nonstocked | | | | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 10.7 | -- | -- | -- | -- | -- | -- | -- | 6.2 | -- | 4.5 |
| Mesic | 29.4 | -- | -- | -- | -- | 2.0 | -- | -- | 15.0 | -- | 12.4 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 40.1 | -- | -- | -- | -- | 2.0 | -- | -- | 21.2 | -- | 16.9 |
| All types | | | | | | | | | | | |
| Hydric | 73.0 | -- | -- | -- | -- | -- | -- | -- | 30.6 | 17.3 | 25.1 |
| Hydromesic | 769.2 | 0.6 | -- | 4.2 | -- | 50.9 | 25.2 | -- | 384.3 | 45.8 | 258.2 |
| Mesic | 1,534.2 | 0.6 | -- | -- | -- | 83.5 | 15.1 | -- | 723.6 | 75.0 | 636.4 |
| Xeromesic | 82.8 | 11.7 | -- | 3.4 | -- | 14.9 | 12.3 | -- | 12.4 | 2.1 | 26.0 |
| Xeric | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.2 |
| All classes | 2,463.4 | 12.9 | -- | 7.6 | -- | 149.3 | 52.6 | -- | 1,150.9 | 140.2 | 949.9 |

Table 5.--Area of commercial forest land by ownership class and site class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| National Forest | 12.9 | -- | -- | -- | 0.4 | 6.4 | 6.1 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 7.6 | -- | -- | -- | 4.2 | -- | 3.4 |
| Indian | -- | -- | -- | -- | -- | -- | -- |
| State | 149.3 | -- | -- | 10.9 | 44.8 | 73.2 | 20.4 |
| County and municipal | 52.6 | -- | -- | -- | 24.6 | 17.8 | 10.2 |
| Forest industry | -- | -- | -- | -- | -- | -- | -- |
| Farmer | 1,150.9 | -- | -- | 58.1 | 431.0 | 463.2 | 198.6 |
| Misc. private-corp. | 140.2 | -- | -- | 7.0 | 30.6 | 65.7 | 36.9 |
| Misc. private-indiv. | 949.9 | -- | -- | 37.9 | 303.0 | 390.8 | 218.2 |
| All owners | 2,463.4 | -- | -- | 113.9 | 838.6 | 1,017.1 | 493.8 |

Table 6.--Area of commercial forest land by ownership class and stand-volume class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Stand-volume class (board feet[1]) | | |
|---|---|---|---|---|
| | | Less than 1,500 | 1,501 to 5,000 | 5,001+ |
| National Forest | 12.9 | 5.2 | 7.1 | 0.6 |
| Bureau of Land Mgmt. | -- | -- | -- | -- |
| Miscellaneous federal | 7.6 | 7.6 | -- | -- |
| Indian | -- | -- | -- | -- |
| State | 149.3 | 30.7 | 79.0 | 39.6 |
| County and municipal | 52.6 | 37.3 | 3.3 | 12.0 |
| Forest industry | -- | -- | -- | -- |
| Farmer | 1,150.9 | 451.0 | 431.9 | 268.0 |
| Misc. private-corp. | 140.2 | 63.9 | 33.0 | 43.3 |
| Misc. private-indiv. | 949.9 | 412.8 | 321.5 | 215.6 |
| All owners | 2,463.4 | 1,008.5 | 875.8 | 579.1 |

[1] International ¼-inch.

Table 7.--Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class and owner tenure class | Total | Size of owner (acres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-4 | 5-10 | 11-20 | 21-50 | 51-100 | 101-500 | 501-2,500 | 2,501-5,000 | 5001+ |
| Forest Industry | | | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Farmer | | | | | | | | | | |
| 1-4 years | 173.0 | 3.3 | 14.0 | 39.4 | 51.6 | 36.1 | 24.4 | 4.2 | -- | -- |
| 5-9 years | 197.5 | 1.2 | 37.9 | 26.5 | 59.0 | 58.5 | 14.4 | -- | -- | -- |
| 10-19 years | 276.9 | 2.7 | 38.8 | 39.2 | 57.7 | 72.1 | 63.0 | 3.4 | -- | -- |
| 20+ years | 503.5 | 13.4 | 42.4 | 84.9 | 132.0 | 115.2 | 105.8 | 6.9 | 2.9 | -- |
| All classes | 1,150.9 | 20.6 | 133.1 | 190.0 | 300.3 | 281.9 | 207.6 | 14.5 | 2.9 | -- |
| Misc. priv.-corporation | | | | | | | | | | |
| 1-4 years | 22.9 | 2.7 | 4.2 | -- | -- | -- | 6.9 | 4.2 | -- | 4.9 |
| 5-9 years | 34.6 | -- | 3.6 | -- | 3.4 | 13.4 | 11.9 | 2.3 | -- | -- |
| 10-19 years | 28.9 | -- | -- | 4.1 | 4.2 | 5.6 | 7.5 | 3.3 | -- | 4.2 |
| 20+ years | 53.8 | -- | -- | -- | 12.8 | 21.8 | 3.4 | 6.1 | -- | 9.7 |
| All classes | 140.2 | 2.7 | 7.8 | 4.1 | 20.4 | 40.8 | 29.7 | 15.9 | -- | 18.8 |
| Misc. priv.-individual | | | | | | | | | | |
| 1-4 years | 226.5 | 17.1 | 47.2 | 37.0 | 74.5 | 38.8 | 11.9 | -- | -- | -- |
| 5-9 years | 245.0 | 27.3 | 50.5 | 56.2 | 85.8 | 11.9 | 9.1 | 4.2 | -- | -- |
| 10-19 years | 163.3 | 18.0 | 19.3 | 28.1 | 56.2 | 23.6 | 13.2 | 4.9 | -- | -- |
| 20+ years | 315.1 | 14.4 | 42.8 | 79.2 | 81.8 | 61.0 | 35.9 | -- | -- | -- |
| All classes | 949.9 | 76.8 | 159.8 | 200.5 | 298.3 | 135.3 | 70.1 | 9.1 | -- | -- |
| All private owners | | | | | | | | | | |
| 1-4 years | 422.4 | 23.1 | 65.4 | 76.4 | 126.1 | 74.9 | 43.2 | 8.4 | -- | 4.9 |
| 5-9 years | 477.1 | 28.5 | 92.0 | 82.7 | 148.2 | 83.8 | 35.4 | 6.5 | -- | -- |
| 10-19 years | 469.1 | 20.7 | 58.1 | 71.4 | 118.1 | 101.3 | 83.7 | 11.6 | -- | 4.2 |
| 20+ years | 872.4 | 27.8 | 85.2 | 164.1 | 226.6 | 198.0 | 145.1 | 13.0 | 2.9 | 9.7 |
| All classes | 2,241.0 | 100.1 | 300.7 | 394.6 | 619.0 | 458.0 | 307.4 | 39.5 | 2.9 | 18.8 |

Table 8.--Area of commercial forest land by forest type, stand-size class, and ownership class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.- corp. | Misc. priv.- indiv. |
| Jack pine | | | | | | | | | | | |
| Sawtimber | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.2 |
| Poletimber | 3.3 | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- |
| Sapling & seedling | 5.1 | 0.3 | -- | -- | -- | -- | 4.8 | -- | -- | -- | -- |
| All stands | 12.6 | 0.3 | -- | -- | -- | 3.3 | 4.8 | -- | -- | -- | 4.2 |
| Red pine | | | | | | | | | | | |
| Sawtimber | 10.1 | 0.1 | -- | -- | -- | 3.4 | 3.3 | -- | -- | -- | 3.3 |
| Poletimber | 18.2 | 0.1 | -- | -- | -- | 7.6 | 3.3 | -- | -- | 2.3 | 4.9 |
| Sapling & seedling | 3.2 | 3.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 31.5 | 3.4 | -- | -- | -- | 11.0 | 6.6 | -- | -- | 2.3 | 8.2 |
| White pine | | | | | | | | | | | |
| Sawtimber | 10.4 | -- | -- | -- | -- | -- | -- | -- | 4.2 | 2.1 | 4.1 |
| Poletimber | 6.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.2 |
| Sapling & seedling | 4.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.9 |
| All stands | 21.5 | -- | -- | -- | -- | -- | -- | -- | 4.2 | 2.1 | 15.2 |
| Balsam fir | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 |
| Black spruce | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.5 | -- | -- | -- | -- | 0.2 | -- | -- | 3.3 | -- | -- |
| Sapling & seedling | 9.5 | -- | -- | -- | -- | -- | -- | -- | 9.5 | -- | -- |
| All stands | 13.0 | -- | -- | -- | -- | 0.2 | -- | -- | 12.8 | -- | -- |

(Table 8 continued on next page)

(Table 8 continued)

| Forest type and stand-size class | All owners | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 |
| All stands | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 |
| Oak-hickory | | | | | | | | | | | |
| Sawtimber | 386.4 | 0.6 | -- | -- | -- | 36.8 | -- | -- | 167.9 | 18.4 | 162.7 |
| Poletimber | 182.9 | 6.8 | -- | -- | -- | 7.5 | 8.3 | -- | 75.5 | -- | 84.8 |
| Sapling & seedling | 94.3 | 0.8 | -- | -- | -- | 15.3 | 5.9 | -- | 29.6 | 6.8 | 35.9 |
| All stands | 663.6 | 8.2 | -- | -- | -- | 59.6 | 14.2 | -- | 273.0 | 25.2 | 283.4 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Sawtimber | 206.3 | 0.2 | -- | 4.2 | -- | 8.4 | 8.0 | -- | 106.8 | 18.2 | 60.5 |
| Poletimber | 179.8 | 0.4 | -- | -- | -- | 10.0 | -- | -- | 89.8 | 16.6 | 63.0 |
| Sapling & seedling | 162.5 | -- | -- | -- | -- | 3.3 | 2.7 | -- | 75.7 | 24.0 | 56.8 |
| All stands | 548.6 | 0.6 | -- | 4.2 | -- | 21.7 | 10.7 | -- | 272.3 | 58.8 | 180.3 |
| Maple-birch | | | | | | | | | | | |
| Sawtimber | 345.6 | -- | -- | -- | -- | 8.5 | 6.9 | -- | 176.8 | 22.8 | 130.6 |
| Poletimber | 190.9 | 0.1 | -- | -- | -- | 12.5 | 4.2 | -- | 97.9 | -- | 76.2 |
| Sapling & seedling | 366.8 | -- | -- | 3.4 | -- | 11.9 | 1.8 | -- | 189.4 | 24.8 | 135.5 |
| All stands | 903.3 | 0.1 | -- | 3.4 | -- | 32.9 | 12.9 | -- | 464.1 | 47.6 | 342.3 |
| Aspen | | | | | | | | | | | |
| Sawtimber | 15.9 | -- | -- | -- | -- | -- | -- | -- | 12.5 | -- | 3.4 |
| Poletimber | 82.8 | 0.2 | -- | -- | -- | 11.7 | -- | -- | 50.2 | -- | 20.7 |
| Sapling & seedling | 85.7 | 0.1 | -- | -- | -- | 6.9 | 3.4 | -- | 36.1 | -- | 39.2 |
| All stands | 184.4 | 0.3 | -- | -- | -- | 18.6 | 3.4 | -- | 98.8 | -- | 63.3 |
| Paper birch | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.3 | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- |
| Sapling & seedling | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.3 |
| All stands | 6.6 | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | 3.3 |
| Exotic | | | | | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 |
| Poletimber | 8.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.3 |
| Sapling & seedling | 13.2 | -- | -- | -- | -- | -- | -- | -- | 1.2 | 4.2 | 7.8 |
| All stands | 26.3 | -- | -- | -- | -- | -- | -- | -- | 1.2 | 4.2 | 20.9 |
| Nonstocked | 40.1 | -- | -- | -- | -- | 2.0 | -- | -- | 21.2 | -- | 16.9 |
| All types | | | | | | | | | | | |
| Sawtimber | 983.7 | 0.9 | -- | 4.2 | -- | 57.1 | 18.2 | -- | 468.2 | 61.5 | 373.6 |
| Poletimber | 686.7 | 7.6 | -- | -- | -- | 52.8 | 15.8 | -- | 320.0 | 18.9 | 271.6 |
| Sapling & seedling | 752.9 | 4.4 | -- | 3.4 | -- | 37.4 | 18.6 | -- | 341.5 | 59.8 | 287.8 |
| Nonstocked | 40.1 | -- | -- | -- | -- | 2.0 | -- | -- | 21.2 | -- | 16.9 |
| All stands | 2,463.4 | 12.9 | -- | 7.6 | -- | 149.3 | 52.6 | -- | 1,150.9 | 140.2 | 949.9 |

Table 9.--Area of commercial forest land by forest type and county, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Allegan | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| Jack pine | 12.6 | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 31.5 | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 21.5 | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | 2.9 | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 7.5 | -- | 2.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 13.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 663.6 | 49.8 | 46.8 | 4.2 | 6.7 | 17.2 | 10.2 | 14.9 | 3.4 | 7.4 | 11.4 | 5.5 |
| Elm-ash-soft maple | 548.6 | 26.5 | 8.3 | 18.6 | 25.0 | 28.5 | 32.4 | 8.2 | 21.3 | 7.8 | 1.2 | 13.9 |
| Maple-birch | 903.3 | 36.3 | 50.1 | 43.3 | 11.2 | 25.5 | 11.4 | 7.4 | 20.8 | 24.6 | 11.9 | 19.7 |
| Aspen | 184.4 | 4.4 | -- | -- | -- | 4.9 | -- | -- | -- | 4.2 | -- | -- |
| Paper birch | 6.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Exotic | 26.3 | 4.8 | 3.4 | -- | 1.2 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 40.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.9 |
| All types | 2,463.4 | 137.4 | 111.2 | 66.1 | 44.1 | 76.1 | 54.0 | 30.5 | 45.5 | 44.0 | 27.4 | 45.0 |

(Table 9 continued)

(Table 9 continued)

| Forest type | County | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | -- | -- | -- | -- | 1.6 | -- | 2.6 | -- | 3.3 | -- | -- | 3.7 |
| White pine | -- | -- | -- | -- | 2.1 | 4.8 | -- | -- | -- | -- | -- | 4.2 |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | 4.9 | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | 0.2 |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.4 |
| Oak-hickory | -- | 3.4 | 6.7 | 35.8 | 16.8 | 36.4 | 17.2 | 8.9 | 43.0 | -- | 13.5 | 38.9 |
| Elm-ash-soft maple | 19.3 | 5.4 | 8.6 | 11.8 | 10.0 | 19.2 | 27.6 | 6.5 | 14.9 | 17.1 | 5.1 | 32.6 |
| Maple-birch | 5.8 | 28.2 | 17.6 | 33.2 | 31.2 | 43.8 | 27.0 | 30.3 | 7.9 | 27.9 | 10.3 | 33.5 |
| Aspen | 26.8 | 5.1 | 4.3 | -- | -- | 14.1 | -- | -- | -- | -- | 4.2 | 23.1 |
| Paper birch | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- |
| Exotic | -- | -- | -- | 2.6 | -- | 4.3 | -- | -- | -- | -- | -- | -- |
| Nonstocked | 4.2 | -- | -- | -- | -- | -- | -- | 2.0 | -- | -- | 2.0 | 4.7 |
| All types | 56.1 | 42.1 | 37.2 | 83.4 | 66.6 | 122.6 | 81.0 | 47.7 | 69.1 | 45.0 | 35.1 | 145.3 |

(Table 9 continued on next page)

Table 9 continued)

| Forest type | County<br>Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 4.5 | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 9.8 | -- | 5.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | 9.5 | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 74.3 | 25.5 | 19.7 | 26.1 | 12.6 | 23.6 | -- | 19.1 | -- | 13.7 | 37.9 | 13.0 |
| Elm-ash-soft maple | 10.4 | 23.2 | 14.1 | 19.6 | 9.5 | 3.3 | 3.3 | 18.5 | 23.6 | 25.3 | 17.0 | 11.0 |
| Maple-birch | 44.7 | 28.8 | 21.4 | 30.2 | 53.1 | 26.8 | 24.3 | 15.2 | 17.6 | 58.2 | 12.6 | 11.5 |
| Aspen | 15.1 | -- | 4.4 | 6.8 | 12.7 | 4.4 | 18.0 | -- | 29.7 | 2.2 | -- | -- |
| Paper birch | -- | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- |
| Exotic | -- | -- | 7.4 | -- | -- | -- | -- | -- | -- | 2.6 | -- | -- |
| Nonstocked | 5.8 | 4.7 | -- | -- | -- | 1.8 | 4.5 | -- | -- | -- | 4.5 | -- |
| All types | 164.6 | 82.2 | 77.5 | 82.7 | 87.9 | 59.9 | 50.1 | 52.8 | 83.7 | 102.0 | 72.0 | 35.5 |

Table 10.--Area of commercial forest land by county and stand-size class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| County | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Allegan | 137.4 | 57.0 | 41.8 | 38.6 | -- |
| Barry | 111.2 | 62.0 | 24.4 | 24.8 | -- |
| Berrien | 66.1 | 42.0 | 12.5 | 11.6 | -- |
| Branch | 44.1 | 23.5 | 11.2 | 9.4 | -- |
| Calhoun | 76.1 | 40.5 | 23.0 | 12.6 | -- |
| Cass | 54.0 | 24.6 | 20.6 | 8.8 | -- |
| Clinton | 30.5 | 10.7 | 8.4 | 11.4 | -- |
| Eaton | 45.5 | 15.5 | 18.9 | 11.1 | -- |
| Genesee | 44.0 | 12.3 | 11.7 | 20.0 | -- |
| Gratiot | 27.4 | 13.7 | 6.2 | 7.5 | -- |
| Hillsdale | 45.0 | 12.1 | 9.7 | 17.3 | 5.9 |
| Huron | 56.1 | 14.0 | 19.4 | 18.5 | 4.2 |
| Ingham | 42.1 | 27.0 | 6.6 | 8.5 | -- |
| Ionia | 37.2 | 15.4 | 4.4 | 17.4 | -- |
| Jackson | 83.4 | 41.8 | 20.7 | 20.9 | -- |
| Kalamazoo | 66.6 | 19.8 | 15.5 | 31.3 | -- |
| Kent | 122.6 | 26.8 | 52.1 | 43.7 | -- |
| Lapeer | 81.0 | 36.8 | 19.1 | 25.1 | -- |
| Lenawee | 47.7 | 20.1 | 10.1 | 15.5 | 2.0 |
| Livingston | 69.1 | 45.4 | 16.7 | 7.0 | -- |
| Macomb | 45.0 | 13.5 | -- | 31.5 | -- |
| Monroe | 35.1 | 17.6 | 5.1 | 10.4 | 2.0 |
| Montcalm | 145.3 | 36.9 | 67.1 | 36.6 | 4.7 |
| Muskegon | 164.6 | 62.7 | 49.8 | 46.2 | 5.9 |
| Oakland | 82.2 | 26.9 | 17.8 | 32.9 | 4.6 |
| Ottawa | 77.5 | 39.4 | 11.2 | 26.9 | -- |
| Saginaw | 82.7 | 19.3 | 21.9 | 41.5 | -- |
| St. Clair | 87.9 | 41.4 | 12.5 | 34.0 | -- |
| St. Joseph | 59.9 | 27.0 | 7.4 | 23.7 | 1.8 |
| Sanilac | 50.1 | 4.2 | 9.4 | 32.0 | 4.5 |
| Shiawassee | 52.8 | 25.5 | 17.4 | 9.9 | -- |
| Tuscola | 83.7 | 11.8 | 56.6 | 15.3 | -- |
| Van Buren | 102.0 | 30.5 | 35.5 | 36.0 | -- |
| Washtenaw | 72.0 | 41.6 | 17.8 | 8.1 | 4.5 |
| Wayne | 35.5 | 24.4 | 4.2 | 6.9 | -- |
| All counties | 2,463.4 | 983.7 | 686.7 | 752.9 | 40.1 |

Table 11.--Area of commercial forest land by forest type, stand-size class, and site class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Jack pine | | | | | | | |
| Sawtimber | 4.2 | -- | -- | -- | -- | 4.2 | -- |
| Poletimber | 3.3 | -- | -- | -- | -- | 3.3 | -- |
| Sapling & seedling | 5.1 | -- | -- | -- | -- | 4.8 | 0.3 |
| All stands | 12.6 | -- | -- | -- | -- | 12.3 | 0.3 |
| Red pine | | | | | | | |
| Sawtimber | 10.1 | -- | -- | 6.6 | 3.4 | 0.1 | -- |
| Poletimber | 18.2 | -- | -- | 12.5 | 3.4 | 2.3 | -- |
| Sapling & seedling | 3.2 | -- | -- | -- | -- | 2.7 | 0.5 |
| All stands | 31.5 | -- | -- | 19.1 | 6.8 | 5.1 | 0.5 |
| White pine | | | | | | | |
| Sawtimber | 10.4 | -- | -- | 6.2 | 4.2 | -- | -- |
| Poletimber | 6.2 | -- | -- | -- | -- | 6.2 | -- |
| Sapling & seedling | 4.9 | -- | -- | -- | -- | 4.9 | -- |
| All stands | 21.5 | -- | -- | 6.2 | 4.2 | 11.1 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 7.5 | -- | -- | -- | -- | 7.5 | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 7.5 | -- | -- | -- | -- | 7.5 | -- |
| Black spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.5 | -- | -- | -- | -- | 0.2 | 3.3 |
| Sapling & seedling | 9.5 | -- | -- | -- | -- | 2.9 | 6.6 |
| All stands | 13.0 | -- | -- | -- | -- | 3.1 | 9.9 |

(Table 11 continued on next page)

(Table 11 continued)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Tamarack | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 4.4 | -- | -- | -- | -- | -- | 4.4 |
| All stands | 4.4 | -- | -- | -- | -- | -- | 4.4 |
| Oak-hickory | | | | | | | |
| Sawtimber | 386.4 | -- | -- | 19.2 | 136.4 | 188.1 | 42.7 |
| Poletimber | 182.9 | -- | -- | -- | 57.5 | 97.0 | 28.4 |
| Sapling & seedling | 94.3 | -- | -- | -- | 19.1 | 58.9 | 16.3 |
| All stands | 663.6 | -- | -- | 19.2 | 213.0 | 344.0 | 87.4 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 206.3 | -- | -- | -- | 100.1 | 65.6 | 40.6 |
| Poletimber | 179.8 | -- | -- | -- | 77.8 | 36.3 | 65.7 |
| Sapling & seedling | 162.5 | -- | -- | -- | 20.3 | 57.4 | 84.8 |
| All stands | 548.6 | -- | -- | -- | 198.2 | 159.3 | 191.1 |
| Maple-birch | | | | | | | |
| Sawtimber | 345.6 | -- | -- | 34.8 | 133.2 | 152.9 | 24.7 |
| Poletimber | 190.9 | -- | -- | 19.3 | 93.1 | 61.6 | 16.9 |
| Sapling & seedling | 366.8 | -- | -- | 11.1 | 73.9 | 185.3 | 96.5 |
| All stands | 903.3 | -- | -- | 65.2 | 300.2 | 399.8 | 138.1 |
| Aspen | | | | | | | |
| Sawtimber | 15.9 | -- | -- | -- | 15.9 | -- | -- |
| Poletimber | 82.8 | -- | -- | -- | 52.6 | 23.4 | 6.8 |
| Sapling & seedling | 85.7 | -- | -- | 4.2 | 37.4 | 25.6 | 18.5 |
| All stands | 184.4 | -- | -- | 4.2 | 105.9 | 49.0 | 25.3 |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.3 | -- | -- | -- | -- | 3.3 | -- |
| Sapling & seedling | 3.3 | -- | -- | -- | -- | -- | 3.3 |
| All stands | 6.6 | -- | -- | -- | -- | 3.3 | 3.3 |
| Exotic | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | 4.8 | -- |
| Poletimber | 8.3 | -- | -- | -- | 3.5 | -- | 4.8 |
| Sapling & seedling | 13.2 | -- | -- | -- | 2.6 | 6.4 | 4.2 |
| All stands | 26.3 | -- | -- | -- | 6.1 | 11.2 | 9.0 |
| Nonstocked | 40.1 | -- | -- | -- | 4.2 | 11.4 | 24.5 |
| All types | | | | | | | |
| Sawtimber | 983.7 | -- | -- | 66.8 | 393.2 | 415.7 | 108.0 |
| Poletimber | 686.7 | -- | -- | 31.8 | 287.9 | 241.1 | 125.9 |
| Sapling & seedling | 752.9 | -- | -- | 15.3 | 153.3 | 348.9 | 235.4 |
| Nonstocked | 40.1 | -- | -- | -- | 4.2 | 11.4 | 24.5 |
| All stands | 2,463.4 | -- | -- | 113.9 | 838.6 | 1,017.1 | 493.8 |

Table 12.--Area of commercial forest land by forest type and stand-age class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All ages | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 12.6 | 4.9 | -- | 0.1 | 0.1 | 3.3 | -- | 4.2 | -- | -- | -- | -- | -- | -- |
| Red pine | 31.5 | 1.0 | 6.5 | 6.7 | 5.8 | 11.5 | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 21.5 | -- | -- | 7.7 | -- | 5.4 | -- | 4.2 | 4.2 | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 7.5 | -- | -- | -- | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 13.0 | 2.9 | -- | 6.6 | -- | -- | -- | -- | 3.3 | -- | -- | 0.2 | -- | -- |
| Tamarack | 4.4 | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 663.6 | 37.9 | 56.6 | 5.3 | 49.6 | 73.9 | 52.1 | 33.6 | 116.1 | 85.5 | 30.7 | 89.9 | 23.5 | 8.9 |
| Elm-ash-soft maple | 548.6 | 67.1 | 79.4 | 53.7 | 65.7 | 39.7 | 61.3 | 31.4 | 37.5 | 41.7 | 16.0 | 46.6 | 8.5 | -- |
| Maple-birch | 903.3 | 186.2 | 157.8 | 50.3 | 73.9 | 59.5 | 44.0 | 79.9 | 56.7 | 64.3 | 54.9 | 57.0 | 18.8 | -- |
| Aspen | 184.4 | 41.5 | 44.2 | 13.9 | 36.0 | 16.8 | 11.2 | 15.9 | 4.9 | -- | -- | -- | -- | -- |
| Paper birch | 6.6 | -- | 3.3 | -- | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Exotic | 26.3 | 3.8 | 6.8 | 7.5 | 3.4 | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 40.1 | 19.7 | 16.6 | 3.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 2,463.4 | 369.4 | 371.2 | 155.6 | 245.3 | 210.1 | 173.4 | 169.2 | 222.7 | 191.5 | 101.6 | 193.7 | 50.8 | 8.9 |

Table 13.--Area of commercial forest land by forest type and site-index class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| Jack pine | 12.6 | -- | -- | 0.2 | 0.1 | -- | 12.3 | -- | -- | -- |
| Red pine | 31.5 | -- | -- | -- | 2.7 | 2.9 | 0.2 | 6.7 | 19.0 | -- |
| White pine | 21.5 | -- | -- | -- | -- | 11.1 | -- | 8.3 | 2.1 | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 7.5 | -- | -- | -- | -- | 7.5 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 13.0 | -- | 6.6 | 3.3 | -- | 0.2 | 2.9 | -- | -- | -- |
| Tamarack | 4.4 | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 663.6 | -- | -- | 13.1 | 35.3 | 114.3 | 194.7 | 176.7 | 101.1 | 28.4 |
| Elm-ash-soft maple | 548.6 | -- | -- | 24.1 | 18.5 | 71.2 | 138.5 | 98.0 | 101.9 | 96.4 |
| Maple-birch | 903.3 | -- | -- | 9.2 | 42.2 | 86.7 | 206.0 | 277.6 | 189.0 | 92.6 |
| Aspen | 184.4 | -- | -- | -- | -- | 33.8 | 40.5 | 28.4 | 77.5 | 4.2 |
| Paper birch | 6.6 | -- | -- | -- | -- | 3.3 | -- | 3.3 | -- | -- |
| Exotic | 26.3 | -- | -- | 4.2 | 10.0 | 6.0 | 6.1 | -- | -- | -- |
| Nonstocked | 40.1 | -- | -- | -- | 20.2 | 10.1 | 1.8 | 3.8 | 4.2 | -- |
| All types | 2,463.4 | -- | 11.0 | 54.1 | 129.0 | 347.1 | 603.0 | 602.8 | 494.8 | 221.6 |

Table 14.--Area of commercial forest land by forest type, stand-size class, and basal-area class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 4.2 | -- | -- | -- | -- | -- | -- | -- | -- | 4.2 | -- | -- | -- | -- | -- |
| Poletimber | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- |
| Sapling & seedling | 5.1 | -- | -- | -- | 0.1 | 0.1 | -- | -- | 4.8 | -- | -- | -- | 0.1 | -- | -- |
| All stands | 12.6 | -- | -- | -- | 0.1 | 0.1 | -- | -- | 4.8 | 4.2 | -- | 3.3 | 0.1 | -- | -- |
| Red pine | | | | | | | | | | | | | | |
| Sawtimber | 10.1 | -- | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | 0.1 | 6.7 | -- | -- |
| Poletimber | 18.2 | -- | -- | -- | -- | -- | -- | 4.8 | 1.6 | 0.1 | -- | 9.4 | 2.3 | -- | -- |
| Sapling & seedling | 3.2 | 2.1 | -- | -- | -- | 0.1 | -- | 0.5 | -- | 0.5 | -- | -- | -- | -- | -- |
| All stands | 31.5 | 2.1 | -- | -- | -- | 0.1 | -- | 5.3 | 1.6 | 3.9 | -- | 9.5 | 9.0 | -- | -- |
| White pine | | | | | | | | | | | | | | |
| Sawtimber | 10.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.1 | -- | 8.3 | -- |
| Poletimber | 6.2 | -- | -- | -- | -- | -- | -- | 2.9 | -- | -- | -- | -- | 3.3 | -- | -- |
| Sapling & seedling | 4.9 | -- | -- | 4.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 21.5 | -- | -- | 4.9 | -- | -- | -- | 2.9 | -- | -- | -- | 2.1 | 3.3 | 8.3 | -- |
| Balsam fir | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 7.5 | -- | -- | -- | -- | -- | -- | 2.6 | -- | 4.9 | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 7.5 | -- | -- | -- | -- | -- | -- | 2.6 | -- | 4.9 | -- | -- | -- | -- | -- |
| Black spruce | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.5 | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | 0.2 | -- | -- |
| Sapling & seedling | 9.5 | 2.9 | 3.3 | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- | -- |
| All stands | 13.0 | 2.9 | 3.3 | -- | -- | -- | -- | 3.3 | 3.3 | -- | -- | -- | 0.2 | -- | -- |

(Table 14 continued on next page)

(Table 14 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 4.4 | -- | -- | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 4.4 | -- | -- | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 386.4 | -- | -- | 5.5 | 5.0 | 13.3 | 42.6 | 30.9 | 48.6 | 42.3 | 27.8 | 80.6 | 79.8 | 10.0 | -- |
| Poletimber | 182.9 | -- | -- | -- | -- | 8.3 | 30.1 | 28.2 | 33.6 | 21.7 | 23.2 | 24.2 | 9.4 | -- | 4.2 |
| Sapling & seedling | 94.3 | 5.8 | 3.1 | 2.8 | 27.7 | 33.1 | 7.6 | 14.2 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 663.6 | 5.8 | 3.1 | 8.3 | 32.7 | 54.7 | 80.3 | 73.3 | 82.2 | 64.0 | 51.0 | 104.8 | 89.2 | 10.0 | 4.2 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 206.3 | -- | -- | 7.5 | 19.8 | 19.3 | 10.7 | 19.1 | 38.9 | 21.5 | 6.7 | 28.7 | 29.9 | 4.2 | -- |
| Poletimber | 179.8 | -- | 3.4 | 8.6 | 16.1 | 26.4 | 3.4 | 26.9 | 38.2 | 8.8 | 36.1 | 11.7 | 0.2 | -- | -- |
| Sapling & seedling | 162.5 | 22.2 | 14.0 | 8.9 | 57.9 | 15.8 | 19.9 | 10.9 | 12.9 | -- | -- | -- | -- | -- | -- |
| All stands | 548.6 | 22.2 | 17.4 | 25.0 | 93.8 | 61.5 | 34.0 | 56.9 | 90.0 | 30.3 | 42.8 | 40.4 | 30.1 | 4.2 | -- |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 345.6 | -- | -- | -- | 5.2 | 22.9 | 14.6 | 50.2 | 50.8 | 35.5 | 61.0 | 34.4 | 58.2 | 12.8 | -- |
| Poletimber | 190.9 | -- | -- | 6.0 | 9.1 | -- | 3.6 | 32.7 | 38.5 | 23.4 | 31.4 | 32.9 | 13.3 | -- | -- |
| Sapling & seedling | 366.8 | 30.3 | 70.9 | 52.3 | 53.2 | 41.2 | 17.4 | 48.5 | 18.0 | 20.8 | 8.2 | 3.4 | 2.6 | -- | -- |
| All stands | 903.3 | 30.3 | 70.9 | 58.3 | 67.5 | 64.1 | 35.6 | 131.4 | 107.3 | 79.7 | 100.6 | 70.7 | 74.1 | 12.8 | -- |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 15.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.5 | -- | 7.4 | -- | -- |
| Poletimber | 82.8 | -- | -- | -- | 22.4 | 16.6 | 18.5 | 4.2 | 16.8 | 0.2 | -- | -- | 4.1 | -- | -- |
| Sapling & seedling | 85.7 | 8.1 | 5.5 | 11.8 | 5.9 | 26.2 | 4.3 | 6.1 | 3.3 | 3.4 | 11.1 | -- | -- | -- | -- |
| All stands | 184.4 | 8.1 | 5.5 | 11.8 | 28.3 | 42.8 | 22.8 | 10.3 | 20.1 | 3.6 | 19.6 | -- | 11.5 | -- | -- |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.3 | -- | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 3.3 | -- | -- | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 6.6 | -- | -- | -- | -- | -- | 3.3 | -- | 3.3 | -- | -- | -- | -- | -- | -- |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 | -- | -- | -- |
| Poletimber | 8.3 | -- | -- | -- | -- | -- | 3.5 | -- | -- | -- | -- | -- | 4.8 | -- | -- |
| Sapling & seedling | 13.2 | -- | -- | -- | 1.2 | -- | -- | 6.8 | 5.2 | -- | -- | -- | -- | -- | -- |
| All stands | 26.3 | -- | -- | -- | 1.2 | -- | 3.5 | 6.8 | 5.2 | -- | -- | 4.8 | 4.8 | -- | -- |
| Nonstocked | 40.1 | 26.9 | 11.4 | 1.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 983.7 | -- | -- | 13.0 | 30.0 | 55.5 | 67.9 | 100.2 | 138.3 | 106.8 | 104.0 | 150.7 | 182.0 | 35.3 | -- |
| Poletimber | 686.7 | -- | 3.4 | 14.6 | 47.6 | 51.3 | 59.1 | 105.6 | 132.0 | 59.1 | 90.7 | 81.5 | 37.6 | -- | 4.2 |
| Sapling & seedling | 752.9 | 71.4 | 96.8 | 80.7 | 150.4 | 116.5 | 52.5 | 87.0 | 47.5 | 24.7 | 19.3 | 3.4 | 2.7 | -- | -- |
| Nonstocked | 40.1 | 26.9 | 11.4 | 1.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,463.4 | 98.3 | 111.6 | 110.1 | 228.0 | 223.3 | 179.5 | 292.8 | 317.8 | 190.6 | 214.0 | 235.6 | 222.3 | 35.3 | 4.2 |

Table 15.--Area of commercial forest land by stocking class of growing-stock trees and stand-size class, Southern Lower Peninsula, Michigan, 1980

| Stocking class (percent) | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Less than 16.7 | 40.1 | -- | -- | -- | 40.1 |
| 16.7 to 60.9 | 372.7 | 98.0 | 90.8 | 183.9 | -- |
| 61.0 to 100.9 | 1,003.4 | 360.3 | 308.7 | 334.4 | -- |
| 101.0 to 133.9 | 922.7 | 457.5 | 267.7 | 197.5 | -- |
| 134.0+ | 124.3 | 67.8 | 19.4 | 37.2 | -- |
| All classes | 2,463.4 | 983.5 | 686.7 | 753.1 | 40.1 |

Table 16.--Area of commercial forest land by stocking class based on selected stand components, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | Stocking classified in terms of | | | | |
|---|---|---|---|---|---|
| | All live trees | Growing-stock trees | Desirable trees | Acceptable trees | Rough and rotten trees |
| 0-10 | 4.7 | 23.3 | 2,391.9 | 23.3 | 1,623.4 |
| 11-20 | 13.2 | 39.7 | 50.2 | 39.7 | 515.5 |
| 21-30 | 27.8 | 52.8 | 13.5 | 52.8 | 164.3 |
| 31-40 | 40.8 | 63.1 | 4.4 | 63.1 | 70.0 |
| 41-50 | 82.6 | 108.8 | 3.4 | 117.9 | 43.3 |
| 51-60 | 87.3 | 125.3 | -- | 127.0 | 29.4 |
| 61-70 | 130.0 | 183.4 | -- | 198.6 | 10.9 |
| 71-80 | 105.0 | 252.8 | -- | 261.4 | 0.1 |
| 81-90 | 293.8 | 266.2 | -- | 254.7 | 0.2 |
| 91-100 | 302.4 | 301.0 | -- | 346.5 | -- |
| 101-110 | 345.7 | 367.7 | -- | 366.1 | 1.8 |
| 111-120 | 403.7 | 295.6 | -- | 288.0 | -- |
| 121-130 | 295.6 | 208.0 | -- | 183.8 | 1.8 |
| 131-140 | 222.4 | 127.5 | -- | 92.3 | 2.7 |
| 141-150 | 93.0 | 37.2 | -- | 37.4 | -- |
| 151-160 | 11.2 | 11.0 | -- | 10.8 | -- |
| 161+ | 4.2 | -- | -- | -- | -- |
| Total | 2,463.4 | 2,463.4 | 2,463.4 | 2,463.4 | 2,463.4 |

Table 17.--Area of noncommercial forest land by ownership class, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Ownership class | All areas | Productive-reserved area | Unproductive areas |
|---|---|---|---|
| National Forest | -- | -- | -- |
| Bureau of Land Management | -- | -- | -- |
| Indian | -- | -- | -- |
| Miscellaneous federal | -- | -- | -- |
| State | 66.4 | 66.4 | -- |
| County and municipal | 10.4 | 10.4 | -- |
| Forest industry | -- | -- | -- |
| Farmer | 4.3 | -- | 4.3 |
| Misc. private-corp. | 4.0 | 4.0 | -- |
| Misc. private-indiv. | 0.6 | -- | 0.6 |
| Total | 85.7 | 80.8 | 4.9 |

Table 18.--Area of noncommercial forest land by forest type, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All areas | Productive-reserved area | Unproductive areas |
|---|---|---|---|
| Jack pine | 0.3 | 0.3 | -- |
| Red pine | 1.4 | 1.4 | -- |
| White pine | 0.4 | 0.4 | -- |
| Balsam fir | -- | -- | -- |
| White spruce | -- | -- | -- |
| Black spruce | -- | -- | -- |
| Northern white-cedar | -- | -- | -- |
| Tamarack | 0.6 | -- | 0.6 |
| Oak-hickory | 38.0 | 38.0 | -- |
| Elm-ash-soft maple | 26.4 | 26.4 | -- |
| Maple-birch | 8.2 | 8.2 | -- |
| Aspen | 2.1 | 2.1 | -- |
| Paper birch | -- | -- | -- |
| Exotic | 4.0 | 4.0 | -- |
| Nonstocked | 4.3 | -- | 4.3 |
| All types | 85.7 | 80.8 | 4.9 |

Table 19.--Area of nonforest land with trees by forest type and land use, Southern Lower Peninsula, Michigan, 1980

(In thousand acres)

| Forest type | All uses | Land use | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cropland | Improved pasture | Wooded strips | Idle farmland | Marsh | Wind-breaks | Urban and other windbreaks | Wooded pasture |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 4.8 | -- | -- | 4.8 | -- | -- | -- | -- | -- |
| White pine | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 58.3 | 17.3 | -- | 39.0 | 2.0 | -- | -- | -- | -- |
| Elm-ash-soft maple | 182.2 | 12.3 | -- | 93.1 | 6.7 | 50.8 | 12.1 | -- | 7.2 |
| Maple-birch | 65.1 | 9.0 | -- | 37.5 | -- | 4.2 | 12.2 | -- | 2.2 |
| Aspen | 35.4 | 4.6 | 0.2 | 8.2 | -- | 18.4 | 4.0 | -- | -- |
| Paper birch | 4.5 | -- | 4.5 | -- | -- | -- | -- | -- | -- |
| Exotic | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 350.3 | 43.2 | 4.7 | 182.6 | 8.7 | 73.4 | 28.3 | -- | 9.4 |

## Table 20.--Number of all live trees on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 19,534 | 9,018 | 3,521 | 2,092 | 2,102 | 1,479 | 495 | 393 | 176 | 97 | 66 | 35 | 50 | 10 | -- |
| Red pine | 12,622 | 637 | 2,223 | 4,614 | 3,254 | 1,382 | 439 | 71 | 1 | 1 | -- | -- | -- | -- | -- |
| Jack pine | 5,804 | 1,046 | 2,093 | 1,552 | 578 | 386 | 113 | 36 | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 5,088 | 2,647 | 1,581 | 800 | 27 | 33 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 34 | 13 | -- | -- | -- | 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 2,018 | 722 | 699 | 236 | 158 | 61 | 71 | 26 | -- | -- | 19 | 5 | 19 | 2 | -- |
| Tamarack | 3,615 | 1,739 | 1,094 | 550 | 132 | 21 | 71 | -- | -- | 8 | -- | -- | -- | -- | -- |
| Northern white-cedar | 5,293 | 2,691 | 1,117 | 1,086 | 242 | 106 | 38 | 13 | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 25,090 | 6,805 | 10,592 | 4,964 | 1,613 | 720 | 291 | 105 | -- | -- | -- | -- | -- | -- | -- |
| Total | 79,098 | 25,318 | 22,920 | 15,894 | 8,106 | 4,209 | 1,518 | 644 | 177 | 106 | 85 | 40 | 69 | 12 | -- |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 62,468 | 23,445 | 12,963 | 7,856 | 5,960 | 4,142 | 2,566 | 1,876 | 1,487 | 856 | 521 | 265 | 386 | 131 | 14 |
| Select red oaks | 57,374 | 25,842 | 5,663 | 7,550 | 4,963 | 4,377 | 3,301 | 2,245 | 1,479 | 776 | 508 | 291 | 329 | 50 | -- |
| Other red oaks | 19,801 | 6,531 | 4,193 | 2,688 | 1,572 | 1,572 | 1,470 | 769 | 460 | 281 | 103 | 66 | 76 | 20 | -- |
| Hickory | 43,357 | 25,914 | 5,970 | 3,479 | 3,086 | 2,355 | 1,299 | 611 | 296 | 187 | 65 | 50 | 34 | 5 | 6 |
| Yellow birch | 6,269 | 3,357 | 1,772 | 274 | 456 | 151 | 95 | 105 | 41 | 7 | 6 | 5 | -- | -- | -- |
| Hard maple | 63,590 | 43,163 | 11,158 | 3,277 | 1,824 | 1,558 | 708 | 684 | 577 | 242 | 179 | 82 | 103 | 24 | 11 |
| Soft maple | 184,795 | 111,720 | 31,842 | 18,024 | 9,483 | 5,581 | 2,906 | 1,920 | 1,239 | 714 | 466 | 334 | 394 | 131 | 41 |
| Beech | 9,151 | 5,048 | 871 | 898 | 812 | 382 | 250 | 213 | 237 | 129 | 106 | 82 | 112 | 11 | -- |
| Ash | 178,353 | 110,166 | 39,473 | 14,051 | 6,402 | 3,842 | 1,814 | 1,037 | 720 | 376 | 210 | 113 | 125 | 21 | 3 |
| Balsam poplar | 1,516 | -- | 288 | 307 | 556 | 140 | 101 | 54 | 41 | 15 | 0 | 7 | 7 | -- | -- |
| Cottonwood | 10,673 | 3,880 | 2,785 | 1,231 | 673 | 932 | 350 | 255 | 257 | 85 | 68 | 61 | 66 | 26 | 4 |
| Bigtooth aspen | 23,742 | 9,805 | 3,562 | 4,403 | 2,555 | 1,995 | 1,061 | 288 | 60 | -- | 13 | -- | -- | -- | -- |
| Quaking aspen | 59,835 | 31,567 | 12,438 | 8,803 | 4,557 | 1,436 | 733 | 218 | 79 | -- | 4 | -- | -- | -- | -- |
| Basswood | 34,035 | 21,044 | 4,498 | 3,031 | 2,324 | 1,127 | 718 | 529 | 340 | 191 | 103 | 64 | 59 | 3 | 4 |
| Yellow-poplar | 2,549 | 1,341 | 117 | 317 | 250 | 107 | 101 | 128 | 76 | 22 | 61 | 19 | 10 | -- | -- |
| Black walnut | 3,155 | -- | 595 | 898 | 466 | 469 | 256 | 207 | 165 | 45 | 21 | 18 | 10 | 5 | -- |
| Black cherry | 86,213 | 60,022 | 11,049 | 6,217 | 4,001 | 2,204 | 1,388 | 684 | 313 | 185 | 75 | 56 | 14 | 5 | -- |
| Butternut | 3,593 | 2,253 | 703 | 239 | 219 | 83 | 33 | 33 | 10 | 7 | -- | 5 | 8 | -- | -- |
| Elm | 145,960 | 101,660 | 28,205 | 10,610 | 3,576 | 1,105 | 494 | 172 | 91 | 28 | 15 | -- | 4 | -- | -- |
| Paper birch | 14,542 | 7,101 | 3,366 | 2,477 | 958 | 510 | 64 | 38 | 13 | 8 | 7 | -- | -- | -- | -- |
| Other hardwoods | 91,805 | 60,531 | 18,371 | 7,398 | 2,493 | 1,533 | 540 | 387 | 210 | 72 | 90 | 38 | 100 | 37 | 5 |
| Noncommercial species | 160,185 | 130,480 | 24,704 | 3,342 | 1,123 | 333 | 99 | 69 | 17 | 7 | 6 | 5 | -- | -- | -- |
| Total | 1,262,961 | 784,870 | 224,586 | 107,370 | 58,309 | 35,934 | 20,347 | 12,522 | 8,208 | 4,233 | 2,627 | 1,561 | 1,837 | 469 | 88 |
| All species | 1,342,059 | 810,188 | 247,506 | 123,264 | 66,415 | 40,143 | 21,865 | 13,166 | 8,385 | 4,339 | 2,712 | 1,601 | 1,906 | 481 | 88 |

Table 21.--Number of growing-stock trees on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 19,105 | 9,017 | 3,521 | 1,835 | 2,032 | 1,427 | 472 | 393 | 161 | 97 | 66 | 30 | 44 | 10 | -- |
| Red pine | 11,854 | 637 | 2,223 | 4,157 | 3,006 | 1,335 | 423 | 71 | 1 | 1 | -- | -- | -- | -- | -- |
| Jack pine | 5,768 | 1,039 | 2,087 | 1,529 | 578 | 386 | 113 | 36 | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 5,072 | 2,647 | 1,581 | 800 | 27 | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 34 | 13 | -- | -- | -- | 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 2,018 | 722 | 699 | 236 | 158 | 61 | 71 | 26 | -- | -- | 19 | 5 | 19 | 2 | -- |
| Tamarack | 3,607 | 1,739 | 1,094 | 550 | 132 | 21 | 71 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 4,372 | 2,031 | 1,117 | 963 | 153 | 57 | 38 | 13 | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 21,998 | 6,805 | 8,670 | 4,225 | 1,304 | 673 | 216 | 105 | -- | -- | -- | -- | -- | -- | -- |
| Total | 73,828 | 24,650 | 20,992 | 14,295 | 7,390 | 3,998 | 1,404 | 644 | 162 | 98 | 85 | 35 | 63 | 12 | -- |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 60,307 | 22,982 | 12,432 | 7,567 | 5,602 | 3,959 | 2,423 | 1,797 | 1,473 | 848 | 507 | 254 | 345 | 108 | 10 |
| Select red oaks | 56,172 | 25,281 | 5,663 | 7,497 | 4,897 | 4,141 | 3,246 | 2,176 | 1,438 | 776 | 474 | 264 | 280 | 39 | -- |
| Other red oaks | 19,280 | 6,528 | 4,160 | 2,527 | 1,437 | 1,528 | 1,382 | 750 | 450 | 272 | 101 | 62 | 70 | 13 | -- |
| Hickory | 43,059 | 25,915 | 5,970 | 3,430 | 3,086 | 2,235 | 1,224 | 587 | 285 | 179 | 65 | 44 | 28 | 5 | 6 |
| Yellow birch | 5,675 | 3,018 | 1,772 | 268 | 339 | 96 | 65 | 78 | 21 | 7 | 6 | 5 | -- | -- | -- |
| Hard maple | 62,771 | 43,161 | 10,796 | 3,159 | 1,752 | 1,479 | 664 | 622 | 567 | 227 | 158 | 82 | 84 | 18 | 2 |
| Soft maple | 180,884 | 110,493 | 31,833 | 16,997 | 8,875 | 5,297 | 2,688 | 1,761 | 1,153 | 639 | 395 | 287 | 343 | 112 | 11 |
| Beech | 8,359 | 5,050 | 510 | 751 | 682 | 382 | 214 | 177 | 225 | 114 | 100 | 77 | 69 | 8 | -- |
| Ash | 174,767 | 108,935 | 38,449 | 13,583 | 5,974 | 3,651 | 1,749 | 960 | 698 | 345 | 187 | 103 | 111 | 21 | 1 |
| Balsam poplar | 1,478 | -- | 288 | 307 | 527 | 140 | 101 | 54 | 32 | 15 | -- | 7 | 7 | -- | -- |
| Cottonwood | 10,543 | 3,881 | 2,785 | 1,155 | 673 | 880 | 350 | 255 | 257 | 85 | 68 | 61 | 66 | 26 | 1 |
| Bigtooth aspen | 22,852 | 9,803 | 3,127 | 4,207 | 2,375 | 1,940 | 1,039 | 288 | 60 | -- | 13 | -- | -- | -- | -- |
| Quaking aspen | 55,139 | 29,415 | 11,002 | 8,272 | 4,178 | 1,297 | 674 | 218 | 79 | -- | 4 | -- | -- | -- | -- |
| Basswood | 33,047 | 20,711 | 4,495 | 2,878 | 2,125 | 1,043 | 610 | 473 | 330 | 179 | 83 | 57 | 56 | 3 | 4 |
| Yellow-poplar | 2,549 | 1,341 | 117 | 317 | 250 | 107 | 101 | 128 | 76 | 22 | 61 | 19 | 10 | -- | -- |
| Black walnut | 3,095 | -- | 595 | 898 | 466 | 443 | 227 | 207 | 165 | 45 | 21 | 18 | 10 | -- | -- |
| Black cherry | 82,243 | 58,319 | 10,301 | 5,710 | 3,856 | 1,742 | 1,122 | 614 | 271 | 178 | 75 | 44 | 9 | 2 | -- |
| Butternut | 3,441 | 2,251 | 703 | 239 | 119 | 46 | 33 | 33 | 10 | 7 | -- | -- | -- | -- | -- |
| Elm | 144,349 | 101,659 | 27,733 | 10,100 | 3,288 | 887 | 409 | 154 | 82 | 18 | 15 | -- | 4 | -- | -- |
| Paper birch | 14,090 | 7,100 | 3,037 | 2,476 | 871 | 476 | 64 | 38 | 13 | 8 | 7 | -- | -- | -- | -- |
| Other hardwoods | 85,115 | 57,952 | 16,948 | 5,934 | 1,921 | 1,178 | 426 | 327 | 179 | 29 | 80 | 38 | 76 | 24 | 3 |
| Total | 1,069,215 | 643,795 | 192,716 | 98,272 | 53,293 | 32,947 | 18,811 | 11,697 | 7,864 | 3,993 | 2,420 | 1,422 | 1,568 | 379 | 38 |
| All species | 1,143,043 | 668,445 | 213,708 | 112,567 | 60,683 | 36,945 | 20,215 | 12,341 | 8,026 | 4,091 | 2,505 | 1,457 | 1,631 | 391 | 38 |

Table 22.--Number of short-log trees on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 75 | 52 | 23 | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 25 | 25 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 16 | 16 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 26 | 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 72 | 47 | 25 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 214 | 166 | 48 | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 161 | -- | 78 | 61 | -- | -- | 7 | -- | 12 | 3 | -- |
| Select red oaks | 83 | -- | 17 | 13 | 9 | -- | 16 | 15 | 13 | -- | -- |
| Other red oaks | 85 | -- | 63 | 2 | 1 | 8 | 2 | -- | 3 | 6 | -- |
| Hickory | 62 | -- | 24 | 13 | 11 | 8 | -- | 6 | -- | -- | -- |
| Yellow birch | 43 | -- | 30 | 13 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 49 | -- | -- | 13 | 10 | 7 | 11 | -- | 6 | -- | 2 |
| Soft maple | 154 | -- | 41 | 15 | 52 | 7 | 8 | 5 | 14 | 8 | 4 |
| Beech | 65 | -- | 18 | 24 | -- | -- | 6 | 5 | 10 | 2 | -- |
| Ash | 145 | -- | 40 | 61 | -- | 17 | 6 | 10 | 11 | -- | -- |
| Balsam poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Quaking aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Basswood | 10 | -- | -- | -- | 10 | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 3 | -- | -- | -- | -- | -- | -- | -- | -- | 3 | -- |
| Black cherry | 190 | -- | 138 | 16 | 29 | 7 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 20 | -- | 13 | 7 | -- | -- | -- | -- | -- | -- | -- |
| Paper birch | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 101 | -- | 46 | 43 | 7 | -- | -- | -- | -- | 3 | 2 |
| Total | 1,171 | -- | 508 | 281 | 129 | 54 | 56 | 41 | 69 | 25 | 8 |
| All species | 1,385 | 166 | 556 | 281 | 129 | 54 | 56 | 41 | 69 | 25 | 8 |

Table 23.--Net volume of growing stock on commercial forest land by species group, Southern Lower Peninsula, Michigan, 1966 and 1980

(In million cubic feet)

| Species group | 1966[1] | 1980 |
|---|---|---|
| SOFTWOODS | | |
| White pine | 43.1 | 67.0 |
| Red pine | 18.3 | 48.8 |
| Jack pine | 3.0 | 13.3 |
| White spruce | -- | 1.7 |
| Black spruce | -- | -- |
| Balsam fir | -- | 0.2 |
| Hemlock | 9.6 | 6.8 |
| Tamarack | 10.1 | 4.0 |
| Northern white-cedar | 7.5 | 3.9 |
| Other softwoods | 5.8 | 25.9 |
| Total | 97.4 | 171.6 |
| HARDWOODS | | |
| Select white oak | 228.7 | 309.3 |
| Select red oak | 218.6 | 338.0 |
| Other red oak | 160.6 | 110.9 |
| Hickory | 98.8 | 103.6 |
| Yellow birch | 7.2 | 7.6 |
| Hard maple | 120.0 | 114.7 |
| Soft maple | 274.4 | 398.4 |
| Beech | 55.2 | 47.4 |
| Ash | 160.7 | 227.9 |
| Balsam poplar | 6.4 | 10.1 |
| Cottonwood | 47.0 | 59.9 |
| Bigtooth aspen | 67.3 | 78.7 |
| Quaking aspen | 81.8 | 76.2 |
| Basswood | 53.3 | 83.6 |
| Yellow-poplar | 8.0 | 19.4 |
| Black walnut | 3.2 | 26.6 |
| Black cherry | 51.2 | 116.4 |
| Elm | 149.6 | 58.8 |
| Paper birch | 18.1 | 20.1 |
| Other hardwoods | 37.3 | 80.2 |
| Total | 1,847.4 | 2,287.8 |
| All species | 1,944.8 | 2,459.4 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

Table 24.--Net volume of all live trees on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 68,627 | 4,644 | 10,129 | 13,319 | 7,364 | 9,254 | 5,747 | 4,281 | 3,914 | 2,586 | 5,040 | 2,349 | -- |
| Red pine | 50,839 | 12,111 | 18,049 | 13,315 | 5,893 | 1,440 | 15 | 16 | -- | -- | -- | -- | -- |
| Jack pine | 13,304 | 4,471 | 2,968 | 3,558 | 1,663 | 644 | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 1,816 | 1,426 | 166 | 224 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 185 | -- | -- | 185 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 6,810 | 285 | 686 | 533 | 1,013 | 563 | 5 | -- | 1,168 | 341 | 1,787 | 429 | -- |
| Tamarack | 4,049 | 1,835 | 758 | 275 | 1,142 | -- | -- | 39 | -- | -- | -- | -- | -- |
| Northern white-cedar | 4,616 | 2,471 | 973 | 615 | 352 | 204 | 1 | -- | -- | -- | -- | -- | -- |
| Other softwoods | 28,549 | 9,951 | 6,782 | 6,193 | 3,331 | 2,292 | -- | -- | -- | -- | -- | -- | -- |
| Total | 178,795 | 37,194 | 40,511 | 38,217 | 20,758 | 14,397 | 5,768 | 4,336 | 5,082 | 2,927 | 6,827 | 2,778 | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 321,737 | 21,593 | 32,555 | 39,208 | 36,450 | 37,574 | 40,909 | 29,937 | 23,254 | 14,226 | 27,401 | 15,405 | 3,225 |
| Select red oaks | 347,781 | 17,229 | 27,678 | 43,676 | 54,095 | 51,094 | 45,679 | 32,417 | 26,287 | 18,102 | 25,779 | 5,745 | -- |
| Other red oaks | 114,706 | 6,589 | 9,120 | 15,181 | 22,630 | 17,260 | 14,759 | 11,261 | 5,458 | 3,998 | 6,248 | 2,202 | -- |
| Hickory | 106,714 | 8,177 | 16,993 | 24,149 | 20,239 | 14,096 | 8,816 | 6,494 | 2,885 | 2,325 | 1,680 | 396 | 464 |
| Yellow birch | 9,092 | 728 | 2,113 | 1,072 | 1,411 | 2,004 | 908 | 325 | 279 | 252 | -- | -- | -- |
| Hard maple | 121,428 | 9,755 | 11,168 | 16,527 | 11,572 | 15,579 | 18,670 | 9,761 | 8,684 | 5,344 | 8,430 | 3,156 | 2,782 |
| Soft maple | 427,017 | 48,743 | 56,542 | 59,529 | 48,752 | 45,400 | 39,315 | 29,206 | 23,814 | 19,734 | 31,627 | 16,594 | 7,761 |
| Beech | 53,084 | 2,402 | 4,493 | 4,281 | 4,162 | 4,532 | 7,088 | 5,419 | 5,596 | 4,963 | 8,915 | 1,233 | -- |
| Ash | 237,444 | 39,004 | 37,558 | 39,323 | 29,154 | 22,938 | 23,037 | 15,214 | 11,295 | 6,532 | 10,495 | 2,455 | 439 |
| Balsam poplar | 10,222 | 806 | 2,923 | 1,396 | 1,383 | 1,057 | 1,106 | 505 | -- | 455 | 591 | -- | -- |
| Cottonwood | 60,649 | 2,968 | 3,499 | 8,173 | 5,444 | 5,855 | 9,023 | 3,550 | 3,970 | 4,702 | 7,329 | 5,204 | 932 |
| Bigtooth aspen | 80,346 | 12,730 | 15,433 | 23,336 | 18,896 | 7,056 | 2,229 | 3 | 663 | -- | -- | -- | -- |
| Quaking aspen | 79,264 | 20,491 | 25,426 | 14,671 | 10,854 | 5,232 | 2,372 | -- | 218 | -- | -- | -- | -- |
| Basswood | 88,591 | 7,901 | 11,996 | 10,812 | 10,987 | 12,856 | 10,869 | 7,705 | 4,810 | 3,722 | 4,960 | 331 | 1,642 |
| Yellow-poplar | 19,425 | 1,065 | 1,337 | 1,295 | 1,950 | 2,982 | 3,209 | 879 | 4,016 | 1,757 | 935 | -- | -- |
| Black walnut | 27,646 | 2,491 | 2,776 | 4,863 | 3,590 | 4,380 | 4,423 | 1,633 | 1,052 | 1,228 | 619 | 591 | -- |
| Black cherry | 126,713 | 18,593 | 25,460 | 21,991 | 21,808 | 15,685 | 9,244 | 6,933 | 3,234 | 2,450 | 802 | 513 | -- |
| Butternut | 4,566 | 639 | 1,002 | 892 | 495 | 677 | 180 | 170 | -- | 177 | 334 | -- | -- |
| Elm | 64,172 | 23,733 | 17,015 | 9,338 | 6,230 | 3,402 | 2,468 | 949 | 708 | -- | 329 | -- | -- |
| Paper birch | 20,723 | 7,180 | 5,740 | 5,084 | 1,003 | 786 | 373 | 276 | 281 | -- | -- | -- | -- |
| Other hardwoods | 90,800 | 17,504 | 14,398 | 14,662 | 7,501 | 8,227 | 6,052 | 1,927 | 4,073 | 2,251 | 7,957 | 5,137 | 1,111 |
| Noncommercial species | 17,325 | 7,481 | 5,138 | 1,985 | 1,019 | 894 | 260 | 213 | 133 | 202 | -- | -- | -- |
| Total | 2,429,445 | 277,802 | 330,363 | 361,444 | 319,625 | 279,566 | 250,989 | 164,777 | 130,710 | 92,420 | 144,431 | 58,962 | 18,356 |
| All species | 2,608,240 | 314,996 | 370,874 | 399,661 | 340,383 | 293,963 | 256,757 | 169,113 | 135,792 | 95,347 | 151,258 | 61,740 | 18,356 |

Table 25.--Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Class of timber | All species | Softwoods | Hardwoods |
|---|---|---|---|
| LIVE TREES | | | |
| Growing-stock trees | | | |
| Sawtimber | | | |
| Saw log portion | 1,262,469 | 87,677 | 1,174,792 |
| Upper stem portion | 212,903 | 10,655 | 202,248 |
| Subtotal | 1,475,372 | 98,332 | 1,377,040 |
| Poletimber | 983,987 | 73,263 | 910,724 |
| Total growing-stock | 2,459,359 | 171,595 | 2,287,764 |
| Cull trees | | | |
| Rough and rotten trees | | | |
| Sawtimber | 58,968 | 1,459 | 57,509 |
| Poletimber | 63,258 | 4,444 | 58,814 |
| Subtotal | 122,226 | 5,903 | 116,323 |
| Short-log trees | 26,655 | 1,297 | 25,358 |
| Total cull | 148,881 | 7,200 | 141,681 |
| TOTAL LIVE TREES | 2,608,240 | 178,795 | 2,429,445 |
| SALVABLE DEAD TREES | 31,413 | 2,404 | 29,009 |
| ALL CLASSES | 2,639,653 | 181,199 | 2,458,454 |

Table 26.--Net volume of growing stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species, Southern Lower Peninsula, Michigan, 1980

| Species | Total all live | Growing stock | Short-log cull | Rough and rotten cull | Sawtimber |
|---|---|---|---|---|---|
| | - - - - - - - - -Thousand cubic feet- | | | - - - - - - - - | Thousand board feet[1/] |
| SOFTWOODS | | | | | |
| Balsam fir | 185 | 185 | -- | -- | 708 |
| Eastern redcedar | 357 | 357 | -- | -- | 872 |
| Tamarack | 4,049 | 4,010 | -- | 39 | 7,030 |
| White spruce | 1,816 | 1,718 | 98 | -- | 538 |
| Jack pine | 13,304 | 13,278 | 1 | 25 | 29,599 |
| Red pine | 50,839 | 48,798 | 183 | 1,858 | 109,427 |
| White pine | 68,627 | 66,928 | 492 | 1,207 | 278,683 |
| Scotch pine | 27,131 | 25,361 | 227 | 1,543 | 54,902 |
| Austrian pine | 1,061 | 221 | 155 | 685 | 1,070 |
| Northern white-cedar | 4,616 | 3,929 | 141 | 546 | 4,699 |
| Hemlock | 6,810 | 6,810 | -- | -- | 31,329 |
| Total | 178,795 | 171,595 | 1,297 | 5,903 | 518,857 |
| HARDWOODS | | | | | |
| Boxelder | 5,997 | 4,804 | 279 | 914 | 3,244 |
| Black maple | 788 | 583 | -- | 205 | 3,166 |
| Red maple | 318,107 | 296,657 | 3,629 | 17,821 | 942,371 |
| Silver maple | 108,911 | 101,778 | 835 | 6,298 | 305,030 |
| Sugar maple | 120,640 | 114,077 | 1,780 | 4,783 | 429,899 |
| Ohio buckeye | 258 | 258 | -- | -- | -- |
| Yellow birch | 9,092 | 7,627 | 632 | 833 | 21,552 |
| Paper birch | 20,723 | 20,122 | -- | 601 | 12,825 |
| Bitternut hickory | 34,976 | 33,831 | 251 | 894 | 92,106 |
| Pignut hickory | 13,324 | 13,057 | 202 | 65 | 47,773 |
| Shellbark hickory | 3,603 | 3,418 | -- | 185 | 11,290 |
| Shagbark hickory | 51,682 | 50,198 | 703 | 781 | 163,748 |
| Mockernut hickory | 3,128 | 3,128 | -- | -- | 11,066 |
| Hackberry | 679 | 679 | -- | -- | 2,391 |
| Flowering dogwood | 696 | -- | -- | 696 | -- |
| Beech | 53,084 | 47,446 | 1,850 | 3,788 | 196,968 |
| White ash | 181,187 | 174,941 | 2,293 | 3,953 | 512,905 |
| Black ash | 28,128 | 26,987 | -- | 1,141 | 38,698 |
| Green ash | 28,129 | 25,980 | 1,191 | 958 | 63,711 |
| Honeylocust | 959 | 959 | -- | -- | -- |
| Butternut | 4,566 | 3,384 | -- | 1,182 | 7,525 |
| Black walnut | 27,646 | 26,573 | 288 | 785 | 84,707 |
| Yellow-poplar | | 0 25 | -- | -- | 87,069 |
| Osage orange | 329 | 329 | -- | -- | -- |
| Red mulberry | 597 | -- | -- | 597 | -- |
| Black tupelo | 1,897 | 1,716 | -- | 181 | 3,474 |
| Sycamore | 12,799 | 12,611 | -- | 188 | 53,568 |
| Balsam poplar | 10,222 | 10,053 | -- | 169 | 26,420 |
| Eastern cottonwood | 60,649 | 59,906 | -- | 743 | 246,169 |
| Bigtooth aspen | 80,346 | 78,743 | -- | 1,603 | 149,001 |
| Quaking aspen | 79,264 | 76,160 | -- | 3,104 | 95,703 |
| Black cherry | 126,713 | 116,348 | 2,349 | 8,016 | 274,808 |
| White oak | 266,655 | 256,368 | 2,136 | 8,151 | 987,183 |
| Swamp white oak | 40,259 | 38,572 | 284 | 1,403 | 163,047 |
| Scarlet oak | 1,487 | 1,298 | -- | 189 | 3,015 |
| Northern pin oak | 11,536 | 11,226 | 219 | 91 | 28,743 |
| Bur oak | 14,374 | 13,924 | 335 | 115 | 64,319 |
| Chinkapin oak | 448 | 448 | -- | -- | -- |
| Pin oak | 1,580 | 1,580 | -- | -- | 4,228 |
| Northern red oak | 347,781 | 337,986 | 3 ,419 | 7,376 | 1,379,437 |
| Black oak | 100,103 | 96,743 | 1,607 | 1,753 | 407,076 |
| Black locust | 3,099 | 2,790 | -- | 309 | 4,328 |
| Black willow | 29,155 | 23,737 | 1,563 | 3,855 | 94,262 |
| Sassafras | 34,335 | 28,945 | 181 | 5,209 | 34,503 |
| American basswood | 88,591 | 83,569 | 141 | 4,881 | 300,860 |
| Ammerican elm | 48,637 | 0 5,244 | 191 | 3,202 | 52,672 |
| Slippery elm | 12,164 | 11,297 | -- | 867 | 14,260 |
| Rock elm | 3,372 | 2,259 | -- | 1,113 | 1,558 |
| Noncommercial species | 17,325 | -- | -- | 17,325 | -- |
| Total | 2,429,445 | 2,287,764 | 25,358 | 116,323 | 7,426,678 |
| All species | 2,608,240 | 2,459,359 | 26,655 | 122,226 | 7,945,535 |

Table 27.--Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species | Nongrowing-stock (rough tree) volume |
|---|---|
| Mountain maple | 748 |
| Ailanthus | 540 |
| American hornbeam | 946 |
| Hawthorn | 3,528 |
| Apple | 3,905 |
| Eastern hophornbeam | 6,160 |
| Pin cherry | 814 |
| Chokecherry | 684 |
| All species | 17,325 |

## Table 28.--Net volume of growing stock on commercial forest land by county and species group, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Allegan | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 66,928 | 18,496 | 365 | -- | -- | -- | -- | -- | -- | -- | 1,168 | -- |
| Red pine | 48,798 | 5,233 | 3,332 | -- | -- | 1,142 | -- | -- | -- | -- | -- | -- |
| Jack pine | 13,278 | 4,116 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 1,718 | -- | 1,082 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 185 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 6,810 | 429 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 4,010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 3,929 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 25,939 | 4,816 | 1,009 | -- | 188 | 679 | 1,138 | -- | 389 | -- | -- | -- |
| Total | 171,595 | 33,090 | 5,788 | -- | 188 | 1,821 | 1,138 | -- | 389 | -- | 1,168 | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 309,312 | 24,481 | 14,142 | 1,940 | 8,720 | 8,375 | 3,762 | 1,175 | 2,640 | 6,378 | 4,532 | 1,792 |
| Select red oaks | 337,986 | 23,781 | 34,560 | 7,224 | 1,083 | 993 | 6,825 | 3,104 | 1,218 | 4,270 | 4,903 | 454 |
| Other red oaks | 110,847 | 8,375 | 12,116 | 1,303 | -- | 4,201 | -- | 228 | -- | -- | 2,384 | -- |
| Hickory | 103,632 | 2,516 | 8,659 | 1,174 | 1,837 | 6,343 | 2,650 | 2,505 | 4,215 | 923 | -- | 700 |
| Yellow birch | 7,627 | 564 | 613 | 545 | -- | 550 | 1,977 | -- | -- | -- | -- | -- |
| Hard maple | 114,660 | 1,542 | 17,838 | 12,285 | 1,329 | 1,143 | 1,665 | 538 | 4,601 | 4,558 | 1,190 | 5,088 |
| Soft maple | 398,435 | 21,681 | 21,122 | 10,411 | 22,115 | 17,244 | 17,254 | 5,533 | 5,318 | 7,753 | 7,814 | 1,657 |
| Beech | 47,446 | 3,768 | 3,509 | 2,434 | -- | 1,676 | 1,306 | -- | 1,573 | 1,595 | -- | -- |
| Ash | 227,908 | 12,522 | 6,779 | 5,328 | 8,617 | 15,101 | 7,058 | 2,995 | 9,080 | 5,176 | 3,663 | 3,288 |
| Balsam poplar | 10,053 | -- | -- | 1,414 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 59,906 | 593 | 351 | 5,929 | 1,708 | 447 | 314 | 254 | 213 | 864 | -- | 402 |
| Bigtooth aspen | 78,743 | 4,750 | 1,720 | 1,507 | 1,327 | 352 | -- | 1,009 | 414 | 652 | 1,908 | -- |
| Quaking aspen | 76,160 | 2,220 | 819 | -- | -- | 1,684 | 1,310 | -- | -- | 234 | 339 | -- |
| Basswood | 83,569 | 632 | 4,270 | 2,452 | 1,910 | 9,903 | 2,281 | 847 | 3,918 | 2,817 | 1,120 | 1,935 |
| Yellow-poplar | 19,425 | 3,198 | -- | 7,361 | -- | 598 | 1,945 | -- | -- | -- | -- | -- |
| Black walnut | 26,573 | -- | -- | -- | 605 | -- | 2,989 | 1,062 | 639 | 357 | -- | 1,053 |
| Black cherry | 116,348 | 7,360 | 11,634 | 9,783 | 3,133 | 10,488 | 8,459 | 287 | 334 | 848 | -- | 265 |
| Butternut | 3,384 | -- | -- | 245 | 305 | 471 | 514 | -- | 75 | -- | -- | -- |
| Elm | 58,800 | 2,345 | 2,092 | 5,606 | 2,778 | 2,769 | 5,549 | 280 | 4,066 | 1,060 | 171 | 1,968 |
| Paper birch | 20,122 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 76,828 | 6,883 | 1,570 | 7,415 | 283 | 1,375 | 1,755 | -- | 2,383 | -- | 356 | 1,189 |
| Total | 2,287,764 | 127,211 | 141,794 | 84,356 | 55,750 | 83,713 | 67,613 | 19,817 | 40,687 | 37,485 | 28,380 | 19,791 |
| All species | 2,459,359 | 160,301 | 147,582 | 84,356 | 55,938 | 85,534 | 68,751 | 19,817 | 41,076 | 37,485 | 29,548 | 19,791 |

(Table 28 continued on next page)

(Table 28 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | -- | 135 | -- | -- | 2,280 | 1,186 | -- | -- | -- | -- | -- | 10,744 |
| Red pine | -- | -- | -- | -- | 3,132 | 189 | 2,444 | -- | 4,290 | -- | -- | 4,993 |
| Jack pine | -- | -- | -- | -- | -- | -- | 193 | -- | -- | -- | -- | 954 |
| White spruce | -- | 166 | -- | -- | 256 | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | 185 | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 885 |
| Tamarack | 233 | -- | 267 | -- | -- | 336 | 206 | -- | -- | 810 | -- | 1,361 |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | 662 | -- | 161 |
| Other softwoods | -- | -- | -- | 205 | 5,966 | 707 | -- | -- | 2,479 | -- | -- | -- |
| Total | 233 | 301 | 267 | 205 | 11,634 | 2,418 | 3,028 | -- | 6,769 | 1,472 | -- | 19,098 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | -- | 5,412 | 1,044 | 14,789 | 1,165 | 14,850 | 11,534 | 5,322 | 15,969 | 970 | 8,384 | 22,927 |
| Select red oaks | -- | 2,927 | 4,882 | 12,571 | 2,686 | 14,474 | 8,028 | 2,907 | 22,034 | -- | 8,525 | 26,174 |
| Other red oaks | -- | 297 | 835 | 16,625 | 4,886 | 21,012 | 221 | -- | 826 | -- | 1,261 | 3,468 |
| Hickory | -- | 2,640 | 245 | 12,588 | 2,030 | 1,995 | 2,747 | 6,396 | 4,895 | 789 | 4,842 | 897 |
| Yellow birch | -- | -- | -- | 345 | 306 | 239 | 343 | -- | -- | 224 | -- | 4 |
| Hard maple | -- | 3,378 | 1,249 | -- | 308 | 9,246 | 6,901 | 6,598 | -- | 3,560 | 1,919 | 1,499 |
| Soft maple | 1,921 | 4,774 | 3,353 | 6,930 | 7,611 | 24,980 | 11,551 | 5,462 | 10,413 | 11,309 | 4,325 | 24,139 |
| Beech | -- | 1,118 | 3,327 | -- | 377 | 900 | 1,195 | 579 | -- | 782 | -- | 1,963 |
| Ash | 3,496 | 6,804 | 1,869 | 6,302 | 2,360 | 7,339 | 5,706 | 4,371 | 3,614 | 1,738 | 1,929 | 10,377 |
| Balsam poplar | 1,119 | 290 | -- | -- | -- | -- | 964 | -- | -- | -- | -- | 455 |
| Cottonwood | 11,105 | 4,867 | -- | 542 | 269 | -- | 2,041 | 1,550 | -- | 1,548 | 5,607 | -- |
| Bigtooth aspen | 1,358 | 649 | 1,550 | 3,372 | 3,267 | 5,032 | 333 | 1,117 | 1,359 | -- | -- | 12,688 |
| Quaking aspen | 10,992 | 3,161 | 972 | 247 | 216 | 892 | 2,982 | 574 | 280 | 189 | -- | 5,489 |
| Basswood | -- | 2,779 | 3,377 | 2,522 | 67 | 3,494 | 2,626 | 4,771 | 593 | 1,827 | 2,267 | 1,267 |
| Yellow-poplar | -- | -- | -- | -- | 3,073 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | 440 | 751 | -- | -- | -- | 1,337 | -- | -- | 1,988 | -- |
| Black cherry | 936 | 1,772 | 1,131 | 13,160 | 3,711 | 3,631 | 652 | 1,231 | 4,160 | 197 | 1,734 | 1,620 |
| Butternut | -- | -- | -- | -- | 374 | 1,050 | -- | -- | -- | -- | -- | -- |
| Elm | 305 | 1,998 | 924 | 1,188 | 1,043 | 2,388 | 1,656 | 1,236 | 294 | 1,496 | 1,272 | 4,815 |
| Paper birch | 4,927 | -- | -- | -- | -- | -- | 1,876 | -- | -- | -- | -- | 2,782 |
| Other hardwoods | 619 | 1,652 | 964 | 3,595 | 2,350 | 3,367 | -- | 585 | 369 | 800 | 1,222 | 7,709 |
| Total | 36,778 | 44,518 | 26,162 | 95,527 | 36,099 | 114,889 | 61,356 | 44,036 | 64,806 | 25,429 | 45,275 | 128,273 |
| All species | 37,011 | 44,819 | 26,429 | 95,732 | 47,733 | 117,307 | 64,384 | 44,036 | 71,575 | 26,901 | 45,275 | 147,371 |

(Table 28 continued on next page)

(Table 28 continued)

| Species group | County<br>Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 13,409 | 214 | 4,087 | 1,222 | 7,713 | 322 | -- | -- | 1,012 | 4,575 | -- | -- |
| Red pine | 17,241 | 516 | 6,060 | -- | -- | -- | -- | -- | -- | 226 | -- | -- |
| Jack pine | 5,778 | -- | 2,237 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | 214 | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 3,501 | -- | 1,033 | -- | 632 | -- | -- | -- | 330 | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 797 | -- |
| Northern white-cedar | 21 | -- | -- | -- | -- | -- | -- | -- | 3,085 | -- | -- | -- |
| Other softwoods | -- | -- | 7,187 | 142 | 604 | 169 | -- | -- | -- | 261 | -- | -- |
| Total | 39,950 | 730 | 20,604 | 1,364 | 8,949 | 705 | -- | -- | 4,427 | 5,062 | 797 | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 20,204 | 11,728 | 7,309 | 15,443 | 15,291 | 3,107 | 214 | 9,365 | 2,198 | 5,400 | 28,393 | 10,357 |
| Select red oaks | 32,413 | 17,658 | 11,373 | 3,325 | 12,129 | 13,753 | 328 | 14,234 | 2,096 | 15,717 | 10,788 | 10,549 |
| Other red oaks | 18,636 | 1,638 | 3,676 | 2,387 | -- | 2,836 | -- | 224 | -- | 1,060 | 2,352 | -- |
| Hickory | 188 | 5,170 | 283 | 1,524 | 1,777 | 7,569 | -- | 2,794 | 272 | 4,104 | 7,493 | 872 |
| Yellow birch | 262 | -- | 1,059 | -- | 347 | -- | -- | -- | -- | 249 | -- | -- |
| Hard maple | 662 | 827 | 3,544 | 2,739 | 5,114 | 973 | -- | 2,543 | 5,406 | 5,117 | 996 | 304 |
| Soft maple | 24,178 | 6,571 | 21,360 | 8,129 | 7,622 | 10,666 | 1,758 | 12,426 | 19,149 | 19,675 | 7,068 | 5,163 |
| Beech | 3,217 | 520 | 7,602 | -- | 3,096 | -- | 250 | 1,671 | 371 | 2,390 | 1,355 | 872 |
| Ash | 3,564 | 8,483 | 5,038 | 5,664 | 15,269 | 7,450 | 2,845 | 15,311 | 7,882 | 11,202 | 5,598 | 4,090 |
| Balsam poplar | -- | 814 | -- | 463 | -- | -- | 2,047 | -- | 2,487 | -- | -- | -- |
| Cottonwood | -- | 204 | 1,935 | 1,852 | 9,423 | -- | 676 | 2,687 | 1,418 | 1,034 | 1,266 | 807 |
| Bigtooth aspen | 10,410 | 272 | 994 | 1,748 | 153 | 7,813 | 272 | 1,813 | 7,364 | 2,119 | 1,238 | 183 |
| Quaking aspen | 3,037 | 2,320 | 600 | 6,297 | 3,501 | 519 | 8,503 | 911 | 15,712 | 659 | 673 | 828 |
| Basswood | 31 | 781 | 1,682 | 318 | 5,065 | 1,807 | 667 | 4,161 | 2,694 | 1,120 | 2,207 | 5,361 |
| Yellow-poplar | -- | -- | 481 | -- | -- | 1,930 | -- | -- | -- | 839 | -- | -- |
| Black walnut | -- | 325 | -- | -- | -- | 8,954 | -- | -- | 279 | 287 | 5,507 | -- |
| Black cherry | 1,057 | 3,433 | 734 | 355 | 3,420 | 3,293 | 247 | 3,617 | 1,697 | 8,172 | 3,797 | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | 350 | -- | -- | -- |
| Elm | 590 | 950 | 1,340 | 512 | 510 | 1,239 | 149 | 361 | 620 | 3,321 | 347 | 1,562 |
| Paper birch | 359 | -- | -- | 4,035 | -- | -- | 3,326 | -- | 2,817 | -- | -- | -- |
| Other hardwoods | 2,153 | 465 | 3,420 | 3,999 | 120 | 1,389 | 577 | 842 | -- | 11,586 | 3,614 | 2,222 |
| Total | 120,961 | 62,159 | 72,430 | 58,790 | 82,837 | 73,298 | 21,859 | 72,960 | 72,812 | 94,051 | 82,692 | 43,170 |
| All species | 160,911 | 62,889 | 93,034 | 60,154 | 91,786 | 74,003 | 21,859 | 72,960 | 77,239 | 99,113 | 83,489 | 43,170 |

## Table 29.--Net volume of sawtimber on commercial forest land by county and species group, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Allegan | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 278,683 | 68,648 | 2,187 | -- | -- | -- | -- | -- | -- | -- | 2,707 | -- |
| Red pine | 109,427 | 2,486 | 7,643 | -- | -- | 1,547 | -- | -- | -- | -- | -- | -- |
| Jack pine | 29,599 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 538 | -- | 538 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 708 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 31,329 | 2,324 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 7,030 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 4,699 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 56,844 | 2,671 | 2,175 | -- | 872 | 1,522 | -- | -- | -- | -- | -- | -- |
| Total | 518,857 | 76,129 | 12,543 | -- | 872 | 3,069 | -- | -- | -- | -- | 2,707 | -- |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 1,214,549 | 73,061 | 50,340 | 4,953 | 40,677 | 44,325 | 14,430 | 3,742 | 9,396 | 27,711 | 16,600 | 9,209 |
| Select red oaks | 1,379,437 | 98,195 | 154,222 | 25,936 | 3,530 | 5,750 | 35,192 | 11,909 | 5,669 | 15,527 | 16,189 | 2,628 |
| Other red oaks | 443,062 | 24,597 | 59,761 | 4,228 | -- | 19,400 | -- | 899 | -- | -- | 5,964 | -- |
| Hickory | 325,984 | 8,456 | 24,692 | 1,751 | 6,858 | 22,650 | 10,369 | -- | 5,546 | 2,102 | -- | 2,331 |
| Yellow birch | 21,552 | -- | -- | 2,713 | -- | 2,931 | 7,046 | -- | -- | -- | -- | -- |
| Hard maple | 433,065 | 6,499 | 79,424 | 32,882 | 3,160 | 3,129 | 6,470 | 1,133 | 13,264 | 23,107 | 4,106 | 26,994 |
| Soft maple | 1,247,401 | 78,264 | 65,286 | 24,298 | 76,340 | 55,811 | 73,364 | 14,242 | 22,617 | 34,137 | 33,015 | 3,665 |
| Beech | 196,968 | 12,694 | 16,247 | 7,656 | -- | 8,792 | 5,177 | -- | 8,311 | 4,067 | -- | -- |
| Ash | 615,313 | 46,319 | 12,647 | 13,122 | 16,819 | 55,179 | 25,701 | 11,814 | 14,565 | 14,129 | 12,335 | 9,579 |
| Balsam poplar | 26,420 | -- | -- | 5,883 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 246,169 | 2,983 | 2,017 | 23,730 | 8,836 | 2,592 | 1,871 | 1,272 | 1,083 | 4,956 | -- | 1,490 |
| Bigtooth aspen | 149,001 | 4,846 | 1,891 | 1,642 | 3,163 | 2,210 | -- | 1,611 | 2,601 | -- | 3,920 | -- |
| Quaking aspen | 95,703 | 5,165 | -- | -- | -- | 1,470 | -- | -- | -- | -- | 1,018 | -- |
| Basswood | 300,860 | 3,509 | 23,740 | 13,140 | 4,875 | 41,551 | 7,727 | -- | 14,219 | 2,738 | 6,050 | 10,830 |
| Yellow-poplar | 87,069 | 15,904 | -- | 30,534 | -- | -- | 11,116 | -- | -- | -- | -- | -- |
| Black walnut | 84,707 | -- | -- | -- | 3,230 | -- | 6,187 | 3,860 | -- | 1,296 | -- | 1,405 |
| Black cherry | 274,808 | 15,895 | 31,461 | 35,524 | 10,220 | 27,936 | 23,142 | -- | -- | -- | -- | -- |
| Butternut | 7,525 | -- | -- | -- | -- | 2,605 | -- | -- | -- | -- | -- | -- |
| Elm | 68,490 | 4,806 | 1,977 | 11,453 | 3,154 | 1,141 | 4,633 | -- | 3,803 | 1,350 | -- | 2,809 |
| Paper birch | 12,825 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 195,770 | 14,858 | 1,481 | 35,944 | -- | 4,599 | 3,946 | -- | 8,212 | -- | 1,143 | -- |
| Total | 7,426,678 | 416,051 | 525,186 | 275,389 | 180,862 | 302,071 | 236,371 | 50,482 | 109,286 | 131,120 | 100,340 | 70,940 |
| All species | 7,945,535 | 492,180 | 537,729 | 275,389 | 181,734 | 305,140 | 236,371 | 50,482 | 109,286 | 131,120 | 103,047 | 70,940 |

(Table 29 continued on next page)

(Table 29 continued)

| Species group | County<br>Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | |
| White pine | -- | 660 | -- | -- | 11,696 | 4,953 | -- | -- | -- | -- | -- | 43,119 |
| Red pine | -- | -- | -- | -- | 10,610 | 1,058 | -- | -- | 10,032 | -- | -- | 12,468 |
| Jack pine | -- | -- | -- | -- | -- | -- | 950 | -- | -- | -- | -- | 86 |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | 708 | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4,923 |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3,799 | -- | 243 |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 212 |
| Other softwoods | -- | -- | -- | -- | 12,243 | 1,070 | -- | -- | 8,070 | -- | -- | -- |
| Total | -- | 660 | -- | -- | 34,549 | 7,081 | 1,658 | -- | 18,102 | 3,799 | -- | 61,051 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | -- | 19,969 | 4,392 | 68,145 | 4,103 | 48,506 | 41,198 | 29,895 | 74,880 | 2,828 | 35,636 | 62,204 |
| Select red oaks | -- | 14,901 | 27,189 | 41,670 | 12,950 | 42,921 | 33,369 | 12,160 | 92,946 | -- | 38,815 | 90,197 |
| Other red oaks | -- | 1,746 | 3,546 | 89,223 | 20,839 | 74,018 | -- | -- | 4,412 | -- | 7,642 | 15,168 |
| Hickory | -- | 12,190 | -- | 38,523 | 3,345 | 8,062 | 3,945 | 25,875 | 20,781 | 4,553 | 8,952 | 3,140 |
| Yellow birch | -- | -- | -- | 1,847 | -- | -- | -- | -- | -- | 1,382 | -- | -- |
| Hard maple | -- | 16,107 | 3,557 | -- | -- | 35,213 | 20,877 | 28,687 | -- | 16,422 | 12,271 | 1,595 |
| Soft maple | 1,893 | 15,669 | 11,983 | 28,562 | 27,789 | 49,936 | 37,123 | 11,064 | 32,138 | 39,432 | 22,239 | 58,336 |
| Beech | -- | 3,819 | 11,924 | -- | 1,675 | 3,162 | 4,730 | 3,244 | -- | 4,276 | -- | 5,024 |
| Ash | 9,212 | 18,525 | 6,250 | 7,889 | 1,621 | 12,498 | 15,853 | 15,806 | 12,650 | 4,699 | 2,390 | 18,575 |
| Balsam poplar | 3,856 | -- | -- | -- | -- | -- | 4,709 | -- | -- | -- | -- | 2,389 |
| Cottonwood | 45,346 | 19,909 | -- | 2,786 | 1,539 | -- | -- | 6,697 | -- | 8,065 | 21,411 | -- |
| Bigtooth aspen | -- | 2,660 | 3,894 | 11,238 | 7,605 | -- | -- | 4,521 | 4,227 | -- | -- | 23,755 |
| Quaking aspen | 20,950 | 10,833 | -- | -- | -- | -- | 1,403 | 1,784 | -- | -- | -- | 5,753 |
| Basswood | -- | 7,731 | 14,466 | 4,325 | -- | 16,470 | 9,153 | 11,332 | 2,575 | 9,252 | 7,261 | 4,680 |
| Yellow-poplar | -- | -- | -- | -- | 12,897 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | 1,741 | -- | -- | -- | -- | -- | -- | 2,553 | -- |
| Black cherry | 1,550 | 964 | 1,224 | 41,422 | 8,924 | 6,334 | -- | 1,423 | 1,836 | 1,088 | 2,084 | 883 |
| Butternut | -- | -- | -- | -- | 1,404 | 1,692 | -- | -- | -- | -- | -- | -- |
| Elm | -- | 3,180 | -- | -- | -- | 5,571 | -- | 2,705 | -- | -- | -- | 8,563 |
| Paper birch | 3,570 | -- | -- | -- | -- | -- | 1,203 | -- | -- | -- | -- | 1,494 |
| Other hardwoods | -- | 1,070 | 2,502 | 1,934 | 10,206 | 1,075 | -- | 3,090 | 1,918 | 1,544 | 6,292 | 29,264 |
| Total | 86,377 | 149,273 | 90,927 | 339,305 | 114,897 | 305,458 | 173,563 | 158,283 | 248,363 | 93,541 | 167,546 | 331,020 |
| All species | 86,377 | 149,933 | 90,927 | 339,305 | 149,446 | 312,539 | 175,221 | 158,283 | 266,465 | 97,340 | 167,546 | 392,071 |

(Table 29 continued on next page)

(Table 29 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 58,263 | 1,195 | 15,961 | 6,564 | 41,363 | 1,730 | -- | -- | 6,152 | 13,485 | -- | -- |
| Red pine | 51,801 | 1,410 | 10,372 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 22,435 | -- | 6,128 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 19,116 | -- | 2,052 | -- | 2,914 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2,988 | -- |
| Northern white-cedar | 26 | -- | -- | -- | -- | -- | -- | -- | 4,461 | -- | -- | -- |
| Other softwoods | -- | -- | 28,221 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 151,641 | 2,605 | 62,734 | 6,564 | 44,277 | 1,730 | -- | -- | 10,613 | 13,485 | 2,988 | -- |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 51,878 | 52,378 | 15,980 | 59,630 | 56,487 | 14,986 | 1,244 | 42,202 | 9,214 | 20,193 | 154,586 | 49,571 |
| Select red oaks | 94,579 | 91,873 | 50,256 | 15,862 | 44,737 | 63,767 | -- | 49,320 | 11,062 | 61,551 | 62,532 | 52,033 |
| Other red oaks | 65,784 | 4,451 | 12,830 | 3,065 | -- | 15,654 | -- | 1,312 | -- | 4,815 | 3,708 | -- |
| Hickory | -- | 27,596 | 1,623 | 6,440 | -- | 23,352 | -- | 10,673 | 1,622 | 8,620 | 28,226 | 3,711 |
| Yellow birch | 13 | -- | 3,982 | -- | 1,638 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 4 | 3,061 | 13,198 | 13,258 | 14,148 | -- | -- | 7,722 | 17,186 | 24,205 | 3,723 | 1,663 |
| Soft maple | 71,006 | 28,203 | 70,418 | 17,463 | 27,726 | 42,052 | 6,703 | 45,559 | 49,535 | 43,387 | 18,544 | 9,602 |
| Beech | 11,058 | 2,860 | 39,979 | -- | 12,640 | -- | 1,334 | 6,189 | 1,344 | 14,227 | 2,073 | 4,466 |
| Ash | 4,947 | 30,097 | 12,212 | 9,878 | 43,823 | 29,961 | 9,695 | 37,508 | 15,139 | 27,746 | 20,841 | 15,289 |
| Balsam poplar | -- | 2,014 | -- | 1,442 | -- | -- | 2,821 | -- | 3,306 | -- | -- | -- |
| Cottonwood | -- | -- | 11,551 | 5,625 | 41,123 | -- | -- | 13,410 | 7,471 | 6,543 | 2,776 | 1,087 |
| Bigtooth aspen | 16,803 | -- | -- | 6,654 | -- | 24,724 | 1,520 | 9,421 | 8,073 | 2,022 | -- | -- |
| Quaking aspen | 4,450 | -- | -- | -- | 1,351 | -- | 13,035 | 1,173 | 24,599 | -- | 1,762 | 957 |
| Basswood | 68 | 2,590 | 9,265 | 1,859 | 14,699 | 8,425 | -- | 11,068 | 9,478 | 3,686 | 8,158 | 15,940 |
| Yellow-poplar | -- | -- | -- | -- | -- | 12,033 | -- | -- | -- | 4,585 | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | 39,694 | -- | -- | 1,459 | -- | 23,282 | -- |
| Black cherry | 1,625 | 3,688 | 1,005 | -- | 11,210 | 7,603 | -- | 12,090 | 1,297 | 19,365 | 5,015 | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | 1,824 | -- | -- | -- |
| Elm | 56 | -- | 3,978 | -- | -- | -- | -- | -- | 837 | 5,394 | -- | 3,080 |
| Paper birch | 74 | -- | -- | -- | -- | -- | 2,081 | -- | 4,403 | -- | -- | -- |
| Other hardwoods | 2,107 | -- | 12,853 | 685 | -- | -- | 3,059 | 2,435 | -- | 33,345 | 3,511 | 8,697 |
| Total | 324,452 | 248,811 | 259,130 | 141,861 | 269,582 | 282,251 | 41,492 | 250,082 | 167,849 | 279,684 | 338,737 | 166,096 |
| All species | 476,093 | 251,416 | 321,864 | 148,425 | 313,859 | 283,981 | 41,492 | 250,082 | 178,462 | 293,169 | 341,725 | 166,096 |

Table 30.--Net volume of growing stock on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 66,928 | 4,276 | 9,867 | 13,012 | 7,179 | 9,254 | 5,550 | 4,281 | 3,914 | 2,414 | 4,832 | 2,349 | -- |
| Red pine | 48,798 | 11,410 | 17,238 | 12,940 | 5,739 | 1,440 | 15 | 16 | -- | -- | -- | -- | -- |
| Jack pine | 13,278 | 4,447 | 2,968 | 3,557 | 1,663 | 643 | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 1,718 | 1,426 | 166 | 126 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 185 | -- | -- | 185 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 6,810 | 285 | 686 | 533 | 1,012 | 563 | 5 | -- | 1,168 | 341 | 1,788 | 429 | -- |
| Tamarack | 4,010 | 1,835 | 758 | 275 | 1,142 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 3,929 | 2,226 | 781 | 366 | 352 | 204 | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 25,939 | 8,968 | 5,927 | 5,966 | 2,786 | 2,292 | -- | -- | -- | -- | -- | -- | -- |
| Total | 171,595 | 34,873 | 38,391 | 36,960 | 19,873 | 14,396 | 5,570 | 4,297 | 5,082 | 2,755 | 6,620 | 2,778 | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 309,312 | 21,041 | 31,152 | 37,905 | 34,947 | 36,376 | 40,697 | 29,709 | 22,574 | 13,826 | 25,386 | 13,296 | 2,403 |
| Select red oaks | 337,986 | 17,207 | 27,244 | 42,181 | 53,635 | 49,953 | 45,125 | 32,417 | 25,035 | 16,964 | 23,365 | 4,860 | -- |
| Other red oaks | 110,847 | 6,454 | 8,546 | 14,900 | 21,605 | 16,976 | 14,586 | 11,040 | 5,393 | 3,816 | 5,859 | 1,672 | -- |
| Hickory | 103,632 | 8,016 | 16,993 | 23,227 | 19,474 | 13,748 | 8,566 | 6,292 | 2,885 | 2,076 | 1,495 | 396 | 464 |
| Yellow birch | 7,627 | 720 | 1,777 | 985 | 1,035 | 1,580 | 674 | 325 | 279 | 252 | -- | -- | -- |
| Hard maple | 114,660 | 9,464 | 10,894 | 15,827 | 11,328 | 14,951 | 18,563 | 9,322 | 7,820 | 5,344 | 7,383 | 2,463 | 1,301 |
| Soft maple | 398,435 | 46,620 | 54,191 | 57,313 | 46,488 | 43,134 | 37,682 | 27,757 | 21,361 | 17,991 | 28,920 | 14,612 | 2,366 |
| Beech | 47,446 | 2,148 | 4,106 | 4,281 | 3,757 | 4,027 | 6,864 | 4,925 | 5,334 | 4,738 | 6,232 | 1,034 | -- |
| Ash | 227,908 | 38,137 | 35,901 | 37,963 | 28,410 | 21,682 | 22,637 | 14,396 | 10,567 | 5,963 | 9,565 | 2,455 | 232 |
| Balsam poplar | 10,053 | 806 | 2,905 | 1,396 | 1,383 | 1,057 | 955 | 505 | -- | 455 | 591 | -- | -- |
| Cottonwood | 59,906 | 2,761 | 3,499 | 7,977 | 5,444 | 5,855 | 9,021 | 3,551 | 3,970 | 4,702 | 7,329 | 5,204 | 593 |
| Bigtooth aspen | 78,743 | 12,316 | 14,780 | 22,907 | 18,789 | 7,056 | 2,229 | 3 | 663 | -- | -- | -- | -- |
| Quaking aspen | 76,160 | 19,817 | 24,253 | 13,891 | 10,378 | 5,231 | 2,372 | -- | 218 | -- | -- | -- | -- |
| Basswood | 83,569 | 7,617 | 11,176 | 10,307 | 9,912 | 12,003 | 10,728 | 7,418 | 4,170 | 3,518 | 4,747 | 331 | 1,642 |
| Yellow-poplar | 19,425 | 1,064 | 1,337 | 1,295 | 1,950 | 2,982 | 3,209 | 879 | 4,017 | 1,757 | 935 | -- | -- |
| Black walnut | 26,573 | 2,491 | 2,776 | 4,692 | 3,279 | 4,380 | 4,422 | 1,633 | 1,052 | 1,229 | 619 | -- | -- |
| Black cherry | 116,348 | 17,472 | 24,913 | 18,646 | 19,345 | 14,643 | 8,411 | 6,704 | 3,234 | 2,180 | 585 | 215 | -- |
| Butternut | 3,384 | 639 | 575 | 649 | 495 | 676 | 180 | 170 | -- | -- | -- | -- | -- |
| Elm | 58,800 | 22,615 | 15,794 | 7,819 | 5,416 | 3,176 | 2,289 | 654 | 708 | -- | 329 | -- | -- |
| Paper birch | 20,122 | 7,178 | 5,378 | 4,847 | 1,003 | 786 | 373 | 276 | 281 | -- | -- | -- | -- |
| Other hardwoods | 76,828 | 14,652 | 12,023 | 12,269 | 6,240 | 7,415 | 5,434 | 1,132 | 3,819 | 2,251 | 6,771 | 4,048 | 774 |
| Total | 2,287,764 | 259,235 | 310,213 | 341,277 | 304,313 | 267,687 | 245,017 | 159,108 | 123,380 | 87,062 | 130,111 | 50,586 | 9,775 |
| All species | 2,459,359 | 294,108 | 348,604 | 378,237 | 324,186 | 282,083 | 250,587 | 163,405 | 128,462 | 89,817 | 136,731 | 53,364 | 9,775 |

## Table 31.--Net volume of sawtimber on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 278,683 | 62,584 | 35,892 | 48,485 | 30,653 | 23,241 | 22,079 | 13,874 | 27,387 | 14,488 | -- |
| Red pine | 109,427 | 70,547 | 30,846 | 7,863 | 84 | 87 | -- | -- | -- | -- | -- |
| Jack pine | 29,599 | 17,653 | 8,554 | 3,392 | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 538 | 538 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 708 | 708 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 31,329 | 2,152 | 5,041 | 2,975 | 26 | -- | 6,728 | 2,143 | 9,940 | 2,324 | -- |
| Tamarack | 7,030 | 1,416 | 5,614 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 4,699 | 1,901 | 1,835 | 963 | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 56,844 | 30,696 | 13,868 | 12,280 | -- | -- | -- | -- | -- | -- | -- |
| Total | 518,857 | 188,195 | 101,650 | 75,958 | 30,763 | 23,328 | 28,807 | 16,017 | 37,327 | 16,812 | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 1,214,549 | -- | 181,678 | 200,851 | 226,661 | 169,071 | 130,831 | 80,163 | 142,621 | 72,239 | 10,434 |
| Select red oaks | 1,379,437 | -- | 270,195 | 270,868 | 251,410 | 184,315 | 147,042 | 98,319 | 131,649 | 25,639 | -- |
| Other red oaks | 443,062 | -- | 106,793 | 94,633 | 84,196 | 63,197 | 29,471 | 21,626 | 33,687 | 9,459 | -- |
| Hickory | 325,984 | -- | 111,816 | 83,452 | 51,982 | 38,063 | 16,621 | 11,831 | 8,099 | 2,273 | 1,847 |
| Yellow birch | 21,552 | -- | 5,021 | 8,232 | 3,569 | 1,740 | 1,507 | 1,483 | -- | -- | -- |
| Hard maple | 433,065 | -- | 58,363 | 82,137 | 99,989 | 52,441 | 46,153 | 29,627 | 42,543 | 14,262 | 7,550 |
| Soft maple | 1,247,401 | -- | 237,728 | 227,431 | 195,228 | 146,364 | 110,852 | 91,976 | 149,967 | 75,623 | 12,232 |
| Beech | 196,968 | -- | 19,608 | 20,341 | 38,996 | 28,855 | 28,367 | 25,763 | 30,278 | 4,760 | -- |
| Ash | 615,313 | -- | 142,182 | 114,669 | 124,009 | 77,630 | 57,821 | 32,937 | 52,341 | 12,765 | 959 |
| Balsam poplar | 26,420 | -- | 8,193 | 5,328 | 5,248 | 2,769 | -- | 2,389 | 2,493 | -- | -- |
| Cottonwood | 246,169 | -- | 30,258 | 33,755 | 49,354 | 20,730 | 22,998 | 22,663 | 36,040 | 27,388 | 2,983 |
| Bigtooth aspen | 149,001 | -- | 94,151 | 39,021 | 12,109 | 17 | 3,703 | -- | -- | -- | -- |
| Quaking aspen | 95,703 | -- | 52,896 | 27,946 | 13,606 | -- | 1,255 | -- | -- | -- | -- |
| Basswood | 300,860 | -- | 54,794 | 64,506 | 61,255 | 42,138 | 24,107 | 20,034 | 25,726 | 1,847 | 6,453 |
| Yellow-poplar | 87,069 | -- | 10,157 | 15,831 | 17,872 | 4,943 | 22,957 | 10,654 | 4,655 | -- | -- |
| Black walnut | 84,707 | -- | 16,626 | 23,805 | 22,528 | 8,194 | 4,722 | 6,275 | 2,557 | -- | -- |
| Black cherry | 274,808 | -- | 94,993 | 80,198 | 44,027 | 30,839 | 13,568 | 8,945 | 1,736 | 502 | -- |
| Butternut | 7,525 | -- | 2,357 | 3,344 | 1,002 | 822 | -- | -- | -- | -- | -- |
| Elm | 68,490 | -- | 29,077 | 17,418 | 12,812 | 3,411 | 3,734 | -- | 2,038 | -- | -- |
| Paper birch | 12,825 | -- | 4,171 | 3,916 | 1,940 | 1,203 | 1,595 | -- | -- | -- | -- |
| Other hardwoods | 195,770 | -- | 32,200 | 37,816 | 26,012 | 6,248 | 20,183 | 11,055 | 36,161 | 21,729 | 4,366 |
| Total | 7,426,678 | -- | 1,563,257 | 1,455,498 | 1,343,805 | 882,990 | 687,487 | 475,740 | 702,591 | 268,486 | 46,824 |
| All species | 7,945,535 | 188,195 | 1,664,907 | 1,531,456 | 1,374,568 | 906,318 | 716,294 | 491,757 | 739,918 | 285,298 | 46,824 |

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[1] International 1/4-inch rule.

Table 32.--Net volume of growing stock on commercial forest land by species group and forest type, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| | | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All types | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 66,928 | -- | 2,012 | 24,699 | -- | -- | -- | 188 |
| Red pine | 48,798 | 2 | 34,833 | 3,813 | -- | -- | -- | -- |
| Jack pine | 13,278 | 8,164 | 2,998 | -- | -- | -- | -- | -- |
| White spruce | 1,718 | -- | -- | -- | -- | 1,338 | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 185 | -- | 185 | -- | -- | -- | -- | -- |
| Hemlock | 6,810 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 4,010 | -- | -- | -- | -- | -- | -- | 369 |
| Northern white-cedar | 3,929 | -- | -- | -- | -- | -- | -- | 2,868 |
| Other softwoods | 25,939 | -- | 644 | 1,777 | -- | 1,678 | -- | -- |
| Total | 171,595 | 8,166 | 40,672 | 30,289 | -- | 3,016 | -- | 3,425 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 309,312 | 9 | 772 | 511 | -- | -- | -- | -- |
| Select red oaks | 337,986 | 1,612 | 528 | 2,837 | -- | -- | -- | -- |
| Other red oaks | 110,847 | 55 | 15 | -- | -- | -- | -- | -- |
| Hickory | 103,632 | 306 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 7,627 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 114,660 | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 398,435 | 795 | 15 | 311 | -- | -- | -- | -- |
| Beech | 47,446 | -- | -- | -- | -- | -- | -- | -- |
| Ash | 227,908 | -- | -- | -- | -- | -- | -- | 21 |
| Balsam poplar | 10,053 | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 59,906 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 78,743 | -- | 143 | -- | -- | -- | -- | -- |
| Quaking aspen | 76,160 | -- | -- | -- | -- | -- | -- | 363 |
| Basswood | 83,569 | -- | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | 19,425 | -- | 344 | -- | -- | -- | -- | -- |
| Black walnut | 26,573 | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 116,348 | -- | 4 | 670 | -- | 1,272 | -- | -- |
| Butternut | 3,384 | -- | -- | -- | -- | -- | -- | 350 |
| Elm | 58,800 | -- | -- | -- | -- | -- | -- | 21 |
| Paper birch | 20,122 | -- | -- | -- | -- | -- | -- | 148 |
| Other hardwoods | 76,828 | 183 | -- | -- | -- | -- | -- | -- |
| Total | 2,287,764 | 2,960 | 1,821 | 4,329 | -- | 1,272 | -- | 903 |
| All species | 2,459,359 | 11,126 | 42,493 | 34,618 | -- | 4,288 | -- | 4,328 |

(Table 32 continued on next page)

(Table 32 continued)

| Species group | Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | -- | 13,232 | 2,001 | 19,332 | 3,764 | -- | 1,700 | -- |
| Red pine | -- | 3,848 | 583 | 2,317 | 2,343 | -- | 1,059 | -- |
| Jack pine | -- | 1,783 | -- | 1 | -- | -- | 332 | -- |
| White spruce | -- | 214 | -- | 166 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | 645 | 387 | 5,778 | -- | -- | -- | -- |
| Tamarack | 1,018 | -- | 1,813 | 810 | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | 37 | 664 | 13 | 347 | -- | -- |
| Other softwoods | -- | 1,507 | 389 | 7,769 | -- | -- | 12,175 | -- |
| Total | 1,018 | 21,229 | 5,210 | 36,837 | 6,120 | 347 | 15,266 | -- |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 233,825 | 19,987 | 50,420 | 3,788 | -- | -- | -- |
| Select red oaks | -- | 243,613 | 8,384 | 73,076 | 7,762 | -- | 174 | -- |
| Other red oaks | -- | 96,820 | 2,374 | 10,199 | 1,073 | -- | 311 | -- |
| Hickory | -- | 61,941 | 2,953 | 37,932 | 500 | -- | -- | -- |
| Yellow birch | -- | 242 | 2,101 | 5,284 | -- | -- | -- | -- |
| Hard maple | -- | 7,490 | 2,225 | 104,945 | -- | -- | -- | -- |
| Soft maple | -- | 45,112 | 206,603 | 137,736 | 7,520 | 343 | -- | -- |
| Beech | -- | 2,099 | 2,183 | 42,786 | 378 | -- | -- | -- |
| Ash | -- | 23,715 | 77,188 | 121,314 | 5,483 | 187 | -- | -- |
| Balsam poplar | -- | 365 | 2,840 | 2,283 | 4,565 | -- | -- | -- |
| Cottonwood | -- | 5,979 | 27,325 | 18,837 | 7,765 | -- | -- | -- |
| Bigtooth aspen | -- | 25,525 | 1,779 | 17,615 | 33,681 | -- | -- | -- |
| Quaking aspen | -- | 8,140 | 16,647 | 12,619 | 37,592 | 196 | 603 | -- |
| Basswood | -- | 6,341 | 12,770 | 61,729 | 1,641 | 1,088 | -- | -- |
| Yellow-poplar | -- | 2,537 | 1,945 | 14,599 | -- | -- | -- | -- |
| Black walnut | -- | 18,533 | 2,782 | 5,258 | -- | -- | -- | -- |
| Black cherry | -- | 40,600 | 13,666 | 56,997 | 3,006 | -- | 133 | -- |
| Butternut | -- | 1,099 | 776 | 1,159 | -- | -- | -- | -- |
| Elm | -- | 4,454 | 27,954 | 23,701 | 2,420 | 187 | -- | 63 |
| Paper birch | -- | 1,744 | 3,725 | 6,589 | 6,834 | 1,082 | -- | -- |
| Other hardwoods | -- | 7,622 | 32,082 | 36,821 | 120 | -- | -- | -- |
| Total | -- | 837,796 | 468,289 | 841,899 | 124,128 | 3,083 | 1,221 | 63 |
| All species | 1,018 | 859,025 | 473,499 | 878,736 | 130,248 | 3,430 | 16,487 | 63 |

## Table 33.--Net volume of sawtimber on commercial forest land by species group and forest type, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 278,683 | -- | 5,416 | 90,514 | -- | -- | -- | 879 |
| Red pine | 109,427 | 6 | 79,111 | 7,237 | -- | -- | -- | -- |
| Jack pine | 29,599 | 18,341 | 5,916 | -- | -- | -- | -- | -- |
| White spruce | 538 | -- | -- | -- | -- | 538 | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 708 | -- | 708 | -- | -- | -- | -- | -- |
| Hemlock | 31,329 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 7,030 | -- | -- | -- | -- | -- | -- | 243 |
| Northern white-cedar | 4,699 | -- | -- | -- | -- | -- | -- | 2,880 |
| Other softwoods | 56,844 | -- | 2,196 | 8,768 | -- | 1,449 | -- | -- |
| Total | 518,857 | 18,347 | 93,347 | 106,519 | -- | 1,987 | -- | 4,002 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 1,214,549 | -- | 4,512 | -- | -- | -- | -- | -- |
| Select red oaks | 1,379,437 | 6,768 | 1,755 | 2,832 | -- | -- | -- | -- |
| Other red oaks | 443,062 | 130 | 84 | -- | -- | -- | -- | -- |
| Hickory | 325,984 | 1,337 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 21,552 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 433,065 | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 1,247,401 | 1 | 22 | 1,530 | -- | -- | -- | -- |
| Beech | 196,968 | -- | 2 | -- | -- | -- | -- | -- |
| Ash | 615,313 | -- | -- | -- | -- | -- | -- | -- |
| Balsam poplar | 26,420 | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 246,169 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 149,001 | -- | 2 | -- | -- | -- | -- | -- |
| Quaking aspen | 95,703 | -- | -- | -- | -- | -- | -- | 158 |
| Basswood | 300,860 | -- | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | 87,069 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 84,707 | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 274,808 | -- | 20 | 1,847 | -- | 3,160 | -- | -- |
| Butternut | 7,525 | -- | -- | -- | -- | -- | -- | 1,824 |
| Elm | 68,490 | -- | -- | -- | -- | -- | -- | 60 |
| Paper birch | 12,825 | -- | -- | -- | -- | -- | -- | 187 |
| Other hardwoods | 195,770 | -- | -- | -- | -- | -- | -- | -- |
| Total | 7,426,678 | 8,236 | 6,397 | 6,209 | -- | 3,160 | -- | 2,229 |
| All species | 7,945,535 | 26,583 | 99,744 | 112,728 | -- | 5,147 | -- | 6,231 |

(Table 33 continued on next page)

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[1] International 1/4-inch rule.

(Table 33 continued)

| Species group | Forest type<br>Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | -- | 57,913 | 10,989 | 86,748 | 20,023 | -- | 6,201 | -- |
| Red pine | -- | 8,197 | 1,139 | 5,368 | 6,265 | -- | 2,104 | -- |
| Jack pine | -- | 3,567 | -- | -- | -- | -- | 1,775 | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | 2,978 | 35 | 28,316 | -- | -- | -- | -- |
| Tamarack | -- | -- | 2,988 | 3,799 | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | 58 | 3 | -- | 1,758 | -- | -- |
| Other softwoods | -- | 7,484 | -- | 7,926 | -- | -- | 29,021 | -- |
| Total | -- | 80,139 | 15,209 | 132,160 | 26,288 | 1,758 | 39,101 | -- |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 892,430 | 88,057 | 210,136 | 19,414 | -- | -- | -- |
| Select red oaks | -- | 987,560 | 40,850 | 306,070 | 33,602 | -- | -- | -- |
| Other red oaks | -- | 385,364 | 11,673 | 42,586 | 3,225 | -- | -- | -- |
| Hickory | -- | 194,063 | 7,907 | 120,575 | 2,102 | -- | -- | -- |
| Yellow birch | -- | -- | 1,069 | 20,483 | -- | -- | -- | -- |
| Hard maple | -- | 23,092 | 13,893 | 396,080 | -- | -- | -- | -- |
| Soft maple | -- | 102,871 | 656,906 | 480,355 | 5,716 | -- | -- | -- |
| Beech | -- | 5,911 | 6,411 | 184,644 | -- | -- | -- | -- |
| Ash | -- | 70,028 | 204,842 | 325,291 | 15,152 | -- | -- | -- |
| Balsam poplar | -- | 1,442 | 14,416 | 3,947 | 6,615 | -- | -- | -- |
| Cottonwood | -- | 30,343 | 98,972 | 83,290 | 33,564 | -- | -- | -- |
| Bigtooth aspen | -- | 44,508 | 4,492 | 44,583 | 55,416 | -- | -- | -- |
| Quaking aspen | -- | 4,456 | 36,304 | 15,424 | 39,361 | -- | -- | -- |
| Basswood | -- | 16,232 | 45,782 | 230,610 | 6,453 | 1,783 | -- | -- |
| Yellow-poplar | -- | 12,171 | 11,117 | 63,781 | -- | -- | -- | -- |
| Black walnut | -- | 63,602 | 7,117 | 13,988 | -- | -- | -- | -- |
| Black cherry | -- | 89,638 | 34,725 | 142,830 | 2,588 | -- | -- | -- |
| Butternut | -- | 1,404 | 2,605 | 1,692 | -- | -- | -- | -- |
| Elm | -- | 3,735 | 28,945 | 29,852 | 5,061 | 837 | -- | -- |
| Paper birch | -- | 1,380 | 5,341 | 3,486 | 2,431 | -- | -- | -- |
| Other hardwoods | -- | 8,838 | 104,874 | 82,058 | -- | -- | -- | -- |
| Total | -- | 2,939,068 | 1,426,298 | 2,801,761 | 230,700 | 2,620 | -- | -- |
| All species | -- | 3,019,207 | 1,441,507 | 2,933,921 | 256,988 | 4,378 | 39,101 | -- |

Table 34.--Net volume of growing stock on commercial forest land by species group and ownership class, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| | | Ownership class | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All owners | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 66,928 | 182 | -- | -- | -- | 10,584 | 1,394 | -- | 14,556 | 2,973 | 37,239 |
| Red pine | 48,798 | 1,011 | -- | -- | -- | 16,366 | 14,009 | -- | 516 | 4,377 | 12,519 |
| Jack pine | 13,278 | 374 | -- | -- | -- | 4,727 | 171 | -- | -- | 455 | 7,551 |
| White spruce | 1,718 | -- | -- | -- | -- | -- | -- | -- | 380 | -- | 1,338 |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 185 | -- | -- | -- | -- | 185 | -- | -- | -- | -- | -- |
| Hemlock | 6,810 | 31 | -- | -- | -- | 632 | 3,213 | -- | 330 | 267 | 2,337 |
| Tamarack | 4,010 | -- | -- | -- | -- | 163 | -- | -- | 2,313 | 516 | 1,018 |
| Northern white-cedar | 3,929 | 53 | -- | -- | -- | 129 | -- | -- | 3,400 | -- | 347 |
| Other softwoods | 25,939 | -- | -- | -- | -- | -- | -- | -- | 3,913 | 3,291 | 18,735 |
| Total | 171,595 | 1,651 | -- | -- | -- | 32,786 | 18,787 | -- | 25,408 | 11,879 | 81,084 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 309,312 | 2,553 | -- | 448 | -- | 30,003 | 2,454 | -- | 141,970 | 9,468 | 122,416 |
| Select red oaks | 337,986 | 983 | -- | 185 | -- | 28,462 | 7,103 | -- | 140,860 | 21,657 | 138,736 |
| Other red oaks | 110,847 | 3,754 | -- | -- | -- | 13,080 | 638 | -- | 29,394 | 5,316 | 58,665 |
| Hickory | 103,632 | -- | -- | -- | -- | 3,127 | 1,268 | -- | 63,716 | 1,320 | 34,201 |
| Yellow birch | 7,627 | 25 | -- | -- | -- | 471 | -- | -- | 2,465 | 242 | 4,424 |
| Hard maple | 114,660 | 37 | -- | -- | -- | 1,862 | 504 | -- | 74,813 | 5,332 | 32,112 |
| Soft maple | 398,435 | 697 | -- | 1,001 | -- | 29,112 | 4,529 | -- | 193,439 | 35,728 | 133,929 |
| Beech | 47,446 | 20 | -- | -- | -- | 322 | -- | -- | 27,716 | 3,466 | 15,922 |
| Ash | 227,908 | 123 | -- | -- | -- | 10,534 | 2,299 | -- | 126,943 | 10,196 | 77,813 |
| Balsam poplar | 10,053 | -- | -- | -- | -- | -- | -- | -- | 9,342 | -- | 711 |
| Cottonwood | 59,906 | -- | -- | -- | -- | 701 | -- | -- | 39,198 | 4,206 | 15,801 |
| Bigtooth aspen | 78,743 | 444 | -- | -- | -- | 7,389 | 1,677 | -- | 29,041 | 228 | 39,964 |
| Quaking aspen | 76,160 | 177 | -- | -- | -- | 11,625 | 1,148 | -- | 44,619 | 1,999 | 16,592 |
| Basswood | 83,569 | 55 | -- | -- | -- | 466 | 1,315 | -- | 49,571 | 4,180 | 27,982 |
| Yellow-poplar | 19,425 | -- | -- | -- | -- | -- | -- | -- | 9,225 | 342 | 9,858 |
| Black walnut | 26,573 | -- | -- | -- | -- | -- | -- | -- | 14,379 | 325 | 11,869 |
| Black cherry | 116,348 | 71 | -- | -- | -- | 13,175 | 848 | -- | 59,554 | 5,393 | 37,307 |
| Butternut | 3,384 | -- | -- | -- | -- | -- | 471 | -- | 1,625 | 325 | 963 |
| Elm | 58,800 | 19 | -- | 156 | -- | 810 | 497 | -- | 30,269 | 2,675 | 24,374 |
| Paper birch | 20,122 | 67 | -- | -- | -- | 1,047 | -- | -- | 13,431 | 318 | 5,259 |
| Other hardwoods | 76,828 | -- | -- | -- | -- | 2,200 | 1,813 | -- | 29,116 | 6,205 | 37,494 |
| Total | 2,287,764 | 9,025 | -- | 1,790 | -- | 154,386 | 26,564 | -- | 1,130,686 | 118,921 | 846,392 |
| All species | 2,459,359 | 10,676 | -- | 1,790 | -- | 187,172 | 45,351 | -- | 1,156,094 | 130,800 | 927,476 |

Table 35.--Net volume of sawtimber on commercial forest land by species group and ownership class, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 278,683 | 889 | -- | -- | -- | 58,469 | 5,374 | -- | 64,409 | 15,132 | 134,410 |
| Red pine | 109,427 | 2,007 | -- | -- | -- | 33,356 | 43,801 | -- | 1,410 | 8,376 | 20,477 |
| Jack pine | 29,599 | 791 | -- | -- | -- | 950 | -- | -- | -- | -- | 27,858 |
| White spruce | 538 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 538 |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 708 | -- | -- | -- | -- | 708 | -- | -- | -- | -- | -- |
| Hemlock | 31,329 | 100 | -- | -- | -- | 2,914 | 17,959 | -- | -- | 1,070 | 9,286 |
| Tamarack | 7,030 | -- | -- | -- | -- | 243 | -- | -- | 6,787 | -- | -- |
| Northern white-cedar | 4,699 | 62 | -- | -- | -- | 175 | -- | -- | 2,704 | -- | 1,758 |
| Other softwoods | 56,844 | -- | -- | -- | -- | -- | -- | -- | 9,722 | 9,894 | 37,228 |
| Total | 518,857 | 3,849 | -- | -- | -- | 96,815 | 67,134 | -- | 85,032 | 34,472 | 231,555 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 1,214,549 | 5,042 | -- | -- | -- | 113,926 | 2,781 | -- | 616,169 | 40,750 | 435,881 |
| Select red oaks | 1,379,437 | 3,250 | -- | 886 | -- | 120,309 | 12,102 | -- | 622,077 | 86,508 | 534,305 |
| Other red oaks | 443,062 | 10,314 | -- | -- | -- | 55,516 | -- | -- | 128,804 | 23,139 | 225,289 |
| Hickory | 325,984 | -- | -- | -- | -- | 5,920 | 4,603 | -- | 201,503 | 3,962 | 109,996 |
| Yellow birch | 21,552 | 13 | -- | -- | -- | -- | -- | -- | 5,922 | -- | 15,617 |
| Hard maple | 433,065 | 6 | -- | -- | -- | 7,017 | -- | -- | 285,222 | 19,941 | 120,879 |
| Soft maple | 1,247,401 | 1,149 | -- | 3,995 | -- | 75,975 | 14,061 | -- | 615,796 | 94,392 | 442,033 |
| Beech | 196,968 | 21 | -- | -- | -- | -- | -- | -- | 120,894 | 12,707 | 63,346 |
| Ash | 615,313 | 241 | -- | -- | -- | 33,880 | 10,329 | -- | 318,308 | 32,339 | 220,216 |
| Balsam poplar | 26,420 | -- | -- | -- | -- | -- | -- | -- | 24,978 | -- | 1,442 |
| Cottonwood | 246,169 | -- | -- | -- | -- | 3,078 | -- | -- | 165,797 | 11,091 | 66,203 |
| Bigtooth aspen | 149,001 | 783 | -- | -- | -- | 4,723 | 5,490 | -- | 66,804 | -- | 71,201 |
| Quaking aspen | 95,703 | 588 | -- | -- | -- | 27,101 | 1,626 | -- | 55,298 | 1,797 | 9,293 |
| Basswood | 300,860 | 105 | -- | -- | -- | 2,572 | 2,932 | -- | 160,110 | 22,456 | 112,685 |
| Yellow-poplar | 87,069 | -- | -- | -- | -- | -- | -- | -- | 44,619 | 1,480 | 40,970 |
| Black walnut | 84,707 | -- | -- | -- | -- | -- | -- | -- | 44,944 | -- | 39,763 |
| Black cherry | 274,808 | 68 | -- | -- | -- | 31,621 | -- | -- | 143,622 | 11,551 | 87,946 |
| Butternut | 7,525 | -- | -- | -- | -- | -- | 2,605 | -- | 1,824 | 1,692 | 1,404 |
| Elm | 68,490 | 64 | -- | -- | -- | 60 | -- | -- | 26,096 | 6,052 | 36,218 |
| Paper birch | 12,825 | 80 | -- | -- | -- | 188 | -- | -- | 12,557 | -- | -- |
| Other hardwoods | 195,770 | -- | -- | -- | -- | -- | 6,999 | -- | 83,943 | 20,349 | 84,479 |
| Total | 7,426,678 | 21,724 | -- | 4,881 | -- | 481,886 | 63,528 | -- | 3,745,287 | 390,206 | 2,719,166 |
| All species | 7,945,535 | 25,573 | -- | 4,881 | -- | 578,701 | 130,662 | -- | 3,830,319 | 424,678 | 2,950,721 |

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[1] International 1/4-inch rule.

Table 36.--Net volume of growing stock on commercial forest land by forest type and stand-age class, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 11,126 | 1,783 | -- | 34 | 85 | 3,977 | 2 | 5,245 | -- | -- | -- | -- | -- | -- |
| Red pine | 42,493 | 50 | 3,228 | 9,572 | 9,941 | 19,702 | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 34,618 | -- | -- | 1,667 | -- | 9,524 | -- | 9,585 | 13,842 | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 4,288 | -- | -- | -- | 4,288 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 4,328 | 222 | -- | 1,688 | -- | -- | -- | -- | 1,905 | -- | -- | 513 | -- | -- |
| Tamarack | 1,018 | 1,018 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 859,025 | 19,126 | 23,963 | 3,756 | 46,715 | 90,124 | 72,813 | 52,193 | 170,882 | 116,590 | 43,374 | 174,200 | 38,672 | 6,617 |
| Elm-ash-soft maple | 473,499 | 18,184 | 20,668 | 32,118 | 59,744 | 39,567 | 47,832 | 30,791 | 55,160 | 70,678 | 28,774 | 63,660 | 6,323 | -- |
| Maple-birch | 878,736 | 60,383 | 50,693 | 49,004 | 79,293 | 71,106 | 66,394 | 102,246 | 78,000 | 101,037 | 80,794 | 104,547 | 35,239 | -- |
| Aspen | 130,248 | 13,938 | 18,985 | 7,548 | 21,688 | 19,472 | 13,641 | 30,569 | 4,407 | -- | -- | -- | -- | -- |
| Paper birch | 3,430 | -- | 1,013 | -- | 2,417 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Exotic | 16,487 | 205 | 1,474 | 4,846 | 1,736 | -- | 8,226 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 63 | -- | -- | 63 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 2,459,359 | 114,909 | 120,024 | 110,296 | 225,907 | 253,472 | 208,908 | 230,629 | 324,196 | 288,305 | 152,942 | 342,920 | 80,234 | 6,617 |

Table 37.--Net volume of sawtimber stock on commercial forest land by forest type and stand-age class, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 26,583 | 6,768 | -- | 34 | 93 | 1,360 | 1 | 18,327 | -- | -- | -- | -- | -- | -- |
| Red pine | 99,744 | 258 | 5,081 | 15,758 | 13,561 | 65,086 | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 112,728 | -- | -- | 5,432 | -- | 26,382 | -- | 25,346 | 55,568 | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 5,147 | -- | -- | -- | 5,147 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern | 6,231 | -- | -- | 879 | -- | -- | -- | -- | 4,529 | -- | -- | 823 | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 3,019,207 | 65,824 | 84,977 | 6,550 | 89,139 | 183,641 | 173,938 | 180,015 | 670,199 | 457,408 | 173,345 | 705,508 | 197,936 | 30,727 |
| Elm-ash-soft maple | 1,441,507 | 46,921 | 46,818 | 39,896 | 124,449 | 88,554 | 140,472 | 78,339 | 196,128 | 282,300 | 115,492 | 261,604 | 20,534 | -- |
| Maple-birch | 2,933,921 | 136,803 | 136,365 | 106,552 | 155,577 | 151,490 | 220,159 | 336,184 | 313,892 | 409,358 | 334,514 | 472,532 | 160,495 | -- |
| Aspen | 256,988 | 32,273 | 26,012 | 12,035 | 27,160 | 30,287 | 14,913 | 103,155 | 11,153 | -- | -- | -- | -- | -- |
| Paper birch | 4,378 | -- | 2,594 | -- | 1,784 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Exotic | 39,101 | -- | -- | 1,599 | 2,175 | -- | 35,327 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 7,945,535 | 288,847 | 301,847 | 188,735 | 419,085 | 546,800 | 584,810 | 741,366 | 1,251,469 | 1,149,066 | 623,351 | 1,440,467 | 378,965 | 30,727 |

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[1] International 1/4-inch rule.

Table 38.--Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Jack pine | | | | | | | | |
| Sawtimber | 5,245 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3,985 | -- | -- | -- | -- | -- | -- | 2 |
| Sapling & seedling | 1,896 | -- | -- | -- | 14 | 19 | -- | -- |
| All stands | 11,126 | -- | -- | -- | 14 | 19 | -- | 2 |
| Red pine | | | | | | | | |
| Sawtimber | 18,641 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 23,264 | -- | -- | -- | -- | -- | -- | 2,998 |
| Sapling & seedling | 588 | 50 | -- | -- | -- | 13 | -- | 218 |
| All stands | 42,493 | 50 | -- | -- | -- | 13 | -- | 3,216 |
| White pine | | | | | | | | |
| Sawtimber | 28,566 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 5,521 | -- | -- | -- | -- | -- | -- | 1,136 |
| Sapling & seedling | 531 | -- | -- | 531 | -- | -- | -- | -- |
| All stands | 34,618 | -- | -- | 531 | -- | -- | -- | 1,136 |
| Balsam fir | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 4,288 | -- | -- | -- | -- | -- | -- | 1,083 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 4,288 | -- | -- | -- | -- | -- | -- | 1,083 |
| Black spruce | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2,418 | -- | -- | -- | -- | -- | -- | 1,905 |
| Sapling & seedling | 1,910 | 222 | 206 | -- | -- | -- | -- | -- |
| All stands | 4,328 | 222 | 206 | -- | -- | -- | -- | 1,905 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | -- | 5,245 | -- | -- | -- | -- | -- |
| Poletimber | -- | 4 | 11 | 3,962 | 6 | -- | -- |
| Sapling & seedling | 1,829 | -- | -- | -- | 34 | -- | -- |
| All stands | 1,829 | 5,249 | 11 | 3,962 | 40 | -- | -- |
| Red pine | | | | | | | |
| Sawtimber | -- | 4,290 | -- | 99 | 14,086 | -- | 166 |
| Poletimber | 1,395 | 63 | 2 | 15,580 | 3,166 | 25 | 35 |
| Sapling & seedling | -- | 307 | -- | -- | -- | -- | -- |
| All stands | 1,395 | 4,660 | 2 | 15,679 | 17,252 | 25 | 201 |
| White pine | | | | | | | |
| Sawtimber | -- | -- | -- | 5,139 | -- | 23,427 | -- |
| Poletimber | -- | -- | -- | -- | 4,385 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | 5,139 | 4,385 | 23,427 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | 3,205 | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | 3,205 | -- | -- | -- | -- | -- |
| Black spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | 513 | -- | -- |
| Sapling & seedling | 1,482 | -- | -- | -- | -- | -- | -- |
| All stands | 1,482 | -- | -- | -- | 513 | -- | -- |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 1,018 | -- | -- | -- | 1,018 | -- | -- | -- |
| All stands | 1,018 | -- | -- | -- | 1,018 | -- | -- | -- |
| Oak-hickory | | | | | | | | |
| Sawtimber | 607,844 | -- | -- | 2,317 | 1,706 | 7,959 | 39,305 | 32,782 |
| Poletimber | 208,117 | -- | 7 | -- | -- | 6,548 | 19,912 | 24,290 |
| Sapling & seedling | 43,064 | -- | 579 | 552 | 11,563 | 13,572 | 4,566 | 12,196 |
| All stands | 859,025 | -- | 586 | 2,869 | 13,269 | 28,079 | 63,783 | 69,268 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 273,970 | -- | -- | 2,195 | 9,338 | 13,315 | 8,719 | 21,751 |
| Poletimber | 158,345 | -- | 1,061 | 2,580 | 7,480 | 13,096 | 1,817 | 20,712 |
| Sapling & seedling | 41,184 | 412 | 466 | 1,137 | 14,202 | 6,949 | 6,563 | 5,423 |
| All stands | 473,499 | 412 | 1,527 | 5,912 | 31,020 | 33,360 | 17,099 | 47,886 |
| Maple-birch | | | | | | | | |
| Sawtimber | 518,641 | -- | -- | -- | 2,313 | 12,800 | 10,282 | 46,227 |
| Poletimber | 234,978 | -- | -- | 2,039 | 4,552 | -- | 3,668 | 29,773 |
| Sapling & seedling | 125,117 | 686 | 6,090 | 6,492 | 17,676 | 14,281 | 7,949 | 30,614 |
| All stands | 878,736 | 686 | 6,090 | 8,531 | 24,541 | 27,081 | 21,899 | 106,614 |
| Aspen | | | | | | | | |
| Sawtimber | 30,576 | -- | -- | -- | 8 | -- | -- | -- |
| Poletimber | 66,749 | -- | -- | -- | 10,244 | 11,570 | 12,950 | 2,542 |
| Sapling & seedling | 32,923 | 434 | 161 | 2,432 | 563 | 11,831 | 3,198 | 3,364 |
| All stands | 130,248 | 434 | 161 | 2,432 | 10,815 | 23,401 | 16,148 | 5,906 |
| Paper birch | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2,417 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 1,013 | -- | -- | -- | -- | -- | 1,013 | -- |
| All stands | 3,430 | -- | -- | -- | -- | -- | 1,013 | -- |
| Exotic | | | | | | | | |
| Sawtimber | 8,226 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 6,093 | -- | -- | -- | -- | -- | 1,736 | -- |
| Sapling & seedling | 2,168 | -- | -- | -- | -- | -- | -- | 1,156 |
| All stands | 16,487 | -- | -- | -- | -- | -- | 1,736 | 1,156 |
| Nonstocked | 63 | -- | -- | 63 | -- | -- | -- | -- |
| All types | | | | | | | | |
| Sawtimber | 1,491,709 | -- | -- | 4,512 | 13,365 | 34,074 | 58,306 | 100,760 |
| Poletimber | 716,175 | -- | 1,068 | 4,619 | 22,276 | 31,214 | 40,083 | 84,441 |
| Sapling & seedling | 251,412 | 1,804 | 7,502 | 11,144 | 45,036 | 46,665 | 23,289 | 52,971 |
| Nonstocked | 63 | -- | -- | 63 | -- | -- | -- | -- |
| All stands | 2,459,359 | 1,804 | 8,570 | 20,338 | 80,677 | 111,953 | 121,678 | 238,172 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 60,105 | 57,514 | 46,717 | 145,492 | 182,610 | 31,337 | -- |
| Poletimber | 33,739 | 22,802 | 28,487 | 38,497 | 19,830 | -- | 14,005 |
| Sapling & seedling | -- | 20 | 16 | -- | -- | -- | -- |
| All stands | 93,844 | 80,336 | 75,220 | 183,989 | 202,440 | 31,337 | 14,005 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 40,921 | 30,652 | 10,100 | 60,956 | 64,666 | 11,357 | -- |
| Poletimber | 36,292 | 13,047 | 45,047 | 16,962 | 251 | -- | -- |
| Sapling & seedling | 6,032 | -- | -- | -- | -- | -- | -- |
| All stands | 83,245 | 43,699 | 55,147 | 77,918 | 64,917 | 11,357 | -- |
| Maple-birch | | | | | | | |
| Sawtimber | 63,932 | 51,911 | 97,141 | 69,163 | 130,537 | 34,335 | -- |
| Poletimber | 42,420 | 31,185 | 49,550 | 50,583 | 21,208 | -- | -- |
| Sapling & seedling | 14,829 | 15,272 | 5,788 | 3,325 | 2,115 | -- | -- |
| All stands | 121,181 | 98,368 | 152,479 | 123,071 | 153,860 | 34,335 | -- |
| Aspen | | | | | | | |
| Sawtimber | -- | -- | 14,217 | -- | 16,351 | -- | -- |
| Poletimber | 20,038 | 266 | -- | -- | 9,139 | -- | -- |
| Sapling & seedling | 742 | 3,086 | 7,112 | -- | -- | -- | -- |
| All stands | 20,780 | 3,352 | 21,329 | -- | 25,490 | -- | -- |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2,417 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,417 | -- | -- | -- | -- | -- | -- |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | 8,226 | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | 4,357 | -- | -- |
| Sapling & seedling | 1,012 | -- | -- | -- | -- | -- | -- |
| All stands | 1,012 | -- | -- | 8,226 | 4,357 | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 164,958 | 149,612 | 168,175 | 289,075 | 408,250 | 100,456 | 166 |
| Poletimber | 136,301 | 70,572 | 123,097 | 125,584 | 62,855 | 25 | 14,040 |
| Sapling & seedling | 25,926 | 18,685 | 12,916 | 3,325 | 2,149 | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All stands | 327,185 | 238,869 | 304,188 | 417,984 | 473,254 | 100,481 | 14,206 |

Table 39.--Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Southern Upper Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Jack pine | | | | | | | | |
| Sawtimber | 18,326 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,367 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 6,890 | -- | -- | -- | 31 | -- | -- | -- |
| All stands | 26,583 | -- | -- | -- | 31 | -- | -- | -- |
| Red pine | | | | | | | | |
| Sawtimber | 63,087 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 34,683 | -- | -- | -- | -- | -- | -- | 4,192 |
| Sapling & seedling | 1,974 | 258 | -- | -- | -- | 37 | -- | 850 |
| All stands | 99,744 | 258 | -- | -- | -- | 37 | -- | 5,042 |
| White pine | | | | | | | | |
| Sawtimber | 106,349 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3,778 | -- | -- | -- | -- | -- | -- | 2,832 |
| Sapling & seedling | 2,601 | -- | -- | 2,601 | -- | -- | -- | -- |
| All stands | 112,728 | -- | -- | 2,601 | -- | -- | -- | 2,832 |
| Balsam fir | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 5,147 | -- | -- | -- | -- | -- | -- | 538 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 5,147 | -- | -- | -- | -- | -- | -- | 538 |
| Black spruce | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 5,352 | -- | -- | -- | -- | -- | -- | 4,529 |
| Sapling & seedling | 879 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 6,231 | -- | -- | -- | -- | -- | -- | 4,529 |

(Table 39 continued on next page)

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[1] International 1/4-inch

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | -- | 18,326 | -- | -- | -- | -- | -- |
| Poletimber | -- | 2 | 14 | 1,341 | 10 | -- | -- |
| Sapling & seedling | 6,859 | -- | -- | -- | -- | -- | -- |
| All stands | 6,859 | 18,328 | 14 | 1,341 | 10 | -- | -- |
| Red pine | | | | | | | |
| Sawtimber | -- | 10,032 | -- | 455 | 51,881 | -- | 719 |
| Poletimber | 3,373 | 39 | -- | 24,788 | 2,206 | 43 | 42 |
| Sapling & seedling | -- | 829 | -- | -- | -- | -- | -- |
| All stands | 3,373 | 10,900 | -- | 25,243 | 54,087 | 43 | 761 |
| White pine | | | | | | | |
| Sawtimber | -- | -- | -- | 25,435 | -- | 80,914 | -- |
| Poletimber | -- | -- | -- | -- | 946 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | 25,435 | 946 | 80,914 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | 4,609 | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | 4,609 | -- | -- | -- | -- | -- |
| Black spruce | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | 823 | -- | -- |
| Sapling & seedling | 879 | -- | -- | -- | -- | -- | -- |
| All stands | 879 | -- | -- | -- | 823 | -- | -- |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | | |
| Sawtimber | 2,473,467 | -- | -- | 10,146 | 5,071 | 26,322 | 172,184 | 139,713 |
| Poletimber | 395,067 | -- | 12 | -- | -- | 15,047 | 24,693 | 45,008 |
| Sapling & seedling | 150,673 | -- | 1,928 | 1,683 | 38,936 | 47,988 | 15,550 | 44,519 |
| All stands | 3,019,207 | -- | 1,940 | 11,829 | 44,007 | 89,357 | 212,427 | 229,240 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 1,050,217 | -- | -- | 9,966 | 40,391 | 48,295 | 30,167 | 84,423 |
| Poletimber | 292,885 | -- | 1,302 | 2,502 | 18,822 | 17,405 | 3,151 | 38,977 |
| Sapling & seedling | 98,405 | 1,912 | 1,001 | 1,379 | 24,854 | 22,814 | 8,602 | 16,399 |
| All stands | 1,441,507 | 1,912 | 2,303 | 13,847 | 84,067 | 88,514 | 41,920 | 139,799 |
| Maple-birch | | | | | | | | |
| Sawtimber | 2,133,534 | -- | -- | -- | 9,370 | 50,563 | 46,953 | 180,151 |
| Poletimber | 490,233 | -- | -- | 2,098 | 8,855 | -- | 8,817 | 57,492 |
| Sapling & seedling | 310,154 | 2,786 | 16,474 | 15,870 | 40,705 | 30,212 | 13,025 | 59,094 |
| All stands | 2,933,921 | 2,786 | 16,474 | 17,968 | 58,930 | 80,775 | 68,795 | 296,737 |
| Aspen | | | | | | | | |
| Sawtimber | 103,185 | -- | -- | -- | 30 | -- | -- | -- |
| Poletimber | 95,518 | -- | -- | -- | 13,599 | 16,948 | 19,776 | 1,807 |
| Sapling & seedling | 58,285 | 2,239 | -- | 9,869 | -- | 18,431 | 10,366 | 4,413 |
| All stands | 256,988 | 2,239 | -- | 9,869 | 13,629 | 35,379 | 30,142 | 6,220 |
| Paper birch | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,784 | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 2,594 | -- | -- | -- | -- | -- | 2,594 | -- |
| All stands | 4,378 | -- | -- | -- | -- | -- | 2,594 | -- |
| Exotic | | | | | | | | |
| Sawtimber | 35,326 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3,775 | -- | -- | -- | -- | -- | 2,176 | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 39,101 | -- | -- | -- | -- | -- | 2,176 | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | |
| Sawtimber | 5,983,491 | -- | -- | 20,112 | 54,862 | 125,180 | 249,304 | 404,287 |
| Poletimber | 1,329,589 | -- | 1,314 | 4,600 | 41,276 | 49,400 | 58,613 | 155,375 |
| Sapling & seedling | 632,455 | 7,195 | 19,403 | 31,402 | 104,526 | 119,482 | 50,137 | 125,275 |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 7,945,535 | 7,195 | 20,717 | 56,114 | 200,664 | 294,062 | 358,054 | 684,937 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 266,041 | 229,423 | 201,782 | 574,951 | 713,864 | 133,970 | -- |
| Poletimber | 70,461 | 44,650 | 44,826 | 75,915 | 45,227 | -- | 29,228 |
| Sapling & seedling | -- | 29 | 40 | -- | -- | -- | -- |
| All stands | 336,502 | 274,102 | 246,648 | 650,866 | 759,091 | 133,970 | 29,228 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 138,870 | 127,257 | 46,882 | 249,249 | 248,101 | 26,616 | -- |
| Poletimber | 70,148 | 37,039 | 75,525 | 27,289 | 725 | -- | -- |
| Sapling & seedling | 21,444 | -- | -- | -- | -- | -- | -- |
| All stands | 230,462 | 164,296 | 122,407 | 276,538 | 248,826 | 26,616 | -- |
| Maple-birch | | | | | | | |
| Sawtimber | 244,126 | 222,835 | 414,619 | 295,929 | 537,827 | 131,161 | -- |
| Poletimber | 83,021 | 71,503 | 119,888 | 108,216 | 30,343 | -- | -- |
| Sapling & seedling | 56,617 | 54,620 | 14,371 | 4,281 | 2,099 | -- | -- |
| All stands | 383,764 | 348,958 | 548,878 | 408,426 | 570,269 | 131,161 | -- |
| Aspen | | | | | | | |
| Sawtimber | -- | -- | 49,754 | -- | 53,401 | -- | -- |
| Poletimber | 28,475 | 683 | -- | -- | 14,230 | -- | -- |
| Sapling & seedling | 818 | 7,903 | 4,246 | -- | -- | -- | -- |
| All stands | 29,293 | 8,586 | 54,000 | -- | 67,631 | -- | -- |
| Paper birch | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,784 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,784 | -- | -- | -- | -- | -- | -- |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | 35,326 | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | 1,599 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | 35,326 | 1,599 | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 649,037 | 607,873 | 713,037 | 1,181,345 | 1,605,074 | 372,661 | 719 |
| Poletimber | 257,262 | 158,525 | 240,253 | 237,549 | 96,109 | 43 | 29,270 |
| Sapling & seedling | 86,617 | 63,381 | 18,657 | 4,281 | 2,099 | -- | -- |
| Nonstocked | -- | -- | -- | -- | -- | -- | -- |
| All stands | 992,916 | 829,779 | 971,947 | 1,423,175 | 1,703,282 | 372,704 | 29,989 |

Table 40.--Net volume of sawtimber on commercial forest land by species group and log-grade class, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)[1]

| Species group | All grades | Log grade 1 | Log grade 2 | Log grade 3 | Tie and timber |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| White pine | 278,683 | 22,069 | 35,189 | 176,217 | 45,208 |
| Red pine | 109,427 | 1,141 | 1,093 | 102,819 | 4,374 |
| Jack pine | 29,599 | -- | 296 | 29,007 | 296 |
| White spruce | 538 | -- | -- | 538 | -- |
| Black spruce | -- | -- | -- | -- | -- |
| Balsam fir | 708 | -- | -- | 687 | 21 |
| Hemlock | 31,329 | -- | 3,087 | 28,242 | -- |
| Tamarack | 7,030 | 773 | 2,742 | 3,515 | -- |
| Northern white-cedar | 4,699 | -- | -- | 4,699 | -- |
| Other softwoods | 56,844 | -- | -- | 56,844 | -- |
| Total | 518,857 | 23,983 | 42,407 | 402,568 | 49,899 |
| HARDWOODS | | | | | |
| Select white oaks | 1,214,549 | 86,843 | 289,668 | 653,576 | 184,462 |
| Select red oaks | 1,379,437 | 112,759 | 342,497 | 744,043 | 180,138 |
| Other red oaks | 443,062 | 54,921 | 100,525 | 213,096 | 74,520 |
| Hickory | 325,984 | 11,058 | 72,332 | 205,048 | 37,546 |
| Yellow birch | 21,552 | 22 | 9,812 | 11,289 | 429 |
| Hard Maple | 433,065 | 35,423 | 129,563 | 236,051 | 32,028 |
| Soft maple | 1,247,401 | 160,884 | 265,332 | 774,269 | 46,916 |
| Beech | 196,968 | 5,952 | 25,754 | 142,037 | 23,225 |
| Ash | 615,313 | 108,010 | 158,222 | 328,601 | 20,480 |
| Balsam poplar | 26,420 | 5,177 | 3,246 | 15,373 | 2624 |
| Cottonwood | 246,169 | 53,572 | 49,894 | 138,464 | 4,239 |
| Bigtooth aspen | 149,001 | 7 | 20,153 | 123,955 | 4,886 |
| Quaking aspen | 95,703 | -- | 11,470 | 74,263 | 9,970 |
| Basswood | 300,860 | 83,399 | 80,151 | 131,068 | 6,242 |
| Yellow-poplar | 87,069 | 25,987 | 20,980 | 38,059 | 2,043 |
| Black walnut | 84,707 | 4,713 | 1,043 | 67,999 | 10,952 |
| Black cherry | 274,808 | 21,000 | 1,432 | 230,621 | 21,755 |
| Butternut | 7,525 | -- | -- | 7,525 | -- |
| Elm | 68,490 | 3,862 | 13,623 | 41,196 | 9,809 |
| Paper birch | 12,825 | -- | -- | 11,799 | 1,026 |
| Other hardwoods | 195,770 | 14,443 | 24,317 | 124,349 | 32,661 |
| Total | 7,426,678 | 788,032 | 1,620,014 | 4,312,681 | 705,951 |
| All species | 7,945,535 | 812,015 | 1,662,421 | 4,715,249 | 755,850 |

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[1] International 1/4-inch rule.

Table 41.--Net volume of short-log trees on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand cubic feet)

| | | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All classes | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 492 | 308 | 184 | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 183 | 183 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 98 | 98 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 141 | 141 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 382 | 227 | 155 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,297 | 958 | 339 | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 2,755 | -- | 795 | 897 | -- | -- | 284 | -- | 556 | 223 | -- |
| Select red oaks | 2,419 | -- | 199 | 203 | 214 | -- | 600 | 729 | 474 | -- | -- |
| Other red oaks | 1,826 | -- | 745 | 23 | 14 | 221 | 64 | -- | 229 | 530 | -- |
| Hickory | 1,155 | -- | 172 | 283 | 250 | 202 | -- | 248 | -- | -- | -- |
| Yellow birch | 632 | -- | 377 | 255 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 1,780 | -- | -- | 133 | 108 | 219 | 552 | -- | 483 | -- | 285 |
| Soft maple | 4,465 | -- | 489 | 164 | 1,117 | 196 | 292 | 164 | 687 | 748 | 608 |
| Beech | 1,850 | -- | 200 | 411 | -- | -- | 262 | 225 | 553 | 199 | -- |
| Ash | 3,485 | -- | 439 | 983 | -- | 495 | 207 | 569 | 792 | -- | -- |
| Balsam poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Quaking aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Basswood | 141 | -- | -- | -- | 141 | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 288 | -- | -- | -- | -- | -- | -- | -- | -- | 288 | -- |
| Black cherry | 2,349 | -- | 1,372 | 213 | 535 | 229 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 191 | -- | 113 | 78 | -- | -- | -- | -- | -- | -- | -- |
| Paper birch | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 2,022 | -- | 646 | 603 | 102 | -- | -- | -- | -- | 334 | 337 |
| Total | 25,358 | -- | 5,547 | 4,246 | 2,481 | 1,562 | 2,261 | 1,935 | 3,774 | 2,322 | 1,230 |
| All species | 26,655 | 958 | 5,886 | 4,246 | 2,481 | 1,562 | 2,261 | 1,935 | 3,774 | 2,322 | 1,230 |

Table 42.--Net volume of short-log trees on commercial forest land by species group and diameter class, Southern Lower Peninsula, Michigan, 1980

(In thousand board feet)1/

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.0 10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 2,419 | 1,608 | 811 | -- | -- | -- | -- | -- | -- | -- | -- |
| Red pine | 742 | 742 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 8 | 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 550 | 550 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 2,188 | 1,321 | 867 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 5,907 | 4,229 | 1,678 | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 8,434 | -- | 2,408 | 2,966 | -- | -- | 722 | -- | 1,364 | 974 | -- |
| Select red oaks | 6,708 | -- | 557 | 564 | 574 | -- | 1,809 | 1,938 | 1,266 | -- | -- |
| Other red oaks | 5,645 | -- | 2,792 | 70 | 36 | 614 | 184 | -- | 599 | 1,350 | -- |
| Hickory | 3,635 | -- | 1,062 | 797 | 282 | 791 | -- | 703 | -- | -- | -- |
| Yellow birch | 2,434 | -- | 1,641 | 793 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 5,160 | -- | -- | 648 | 63 | 2,112 | 1,285 | -- | 596 | -- | 456 |
| Soft maple | 13,056 | -- | 1,313 | 198 | 2,790 | 592 | 829 | 641 | 2,034 | 2,266 | 2,393 |
| Beech | 6,019 | -- | 556 | 1,092 | -- | -- | 609 | 588 | 1,506 | 1,668 | -- |
| Ash | 9,328 | -- | 1,373 | 2,301 | -- | 1,468 | 587 | 2,045 | 1,554 | -- | -- |
| Balsam poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Quaking aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Basswood | 993 | -- | -- | -- | 993 | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 246 | -- | -- | -- | -- | -- | -- | -- | -- | 246 | -- |
| Black cherry | 6,446 | -- | 4,410 | 121 | 1,335 | 580 | -- | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 731 | -- | 536 | 195 | -- | -- | -- | -- | -- | -- | -- |
| Paper birch | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 5,082 | -- | 2,173 | 1,224 | 162 | -- | -- | -- | -- | 759 | 764 |
| Total | 73,917 | -- | 18,821 | 10,969 | 6,235 | 6,157 | 6,025 | 5,915 | 8,919 | 7,263 | 3,613 |
| All species | 79,824 | 4,229 | 20,499 | 10,969 | 6,235 | 6,157 | 6,025 | 5,915 | 8,919 | 7,263 | 3,613 |

---

1/International 1/4-inch rule.

Table 43.--Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1965[1] and 1979

(In million cubic feet)

| Species | 1965[1] | 1979 |
|---|---|---|
| Softwoods | 5.7 | 8.7 |
| Hardwoods | 63.2 | 79.1 |
| All species | 68.9 | 87.8 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 44.--Net annual growth of growing stock on commercial forest land by species group and county, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Allegan | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 2,766 | 684 | -- | -- | -- | -- | -- | -- | -- | -- | 84 | -- |
| Red pine | 3,181 | 675 | 165 | -- | -- | 80 | -- | -- | -- | -- | -- | -- |
| Jack pine | 586 | 304 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 507 | -- | 418 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 104 | 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 247 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 1,256 | 312 | 89 | -- | 2 | 36 | 47 | -- | 26 | -- | -- | -- |
| Total | 8,692 | 1,979 | 672 | -- | 2 | 116 | 47 | -- | 26 | -- | 84 | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 6,892 | 632 | 478 | 35 | 165 | 178 | 172 | 27 | 81 | 122 | 72 | 15 |
| Select red oaks | 9,190 | 550 | 852 | 358 | 25 | 15 | 109 | 146 | 27 | 163 | 139 | 4 |
| Other red oaks | 3,823 | 575 | 190 | 130 | -- | 74 | -- | 9 | -- | -- | 80 | -- |
| Hickory | 2,821 | 52 | 210 | 35 | 39 | 109 | 57 | 113 | 134 | 36 | -- | 7 |
| Yellow birch | 186 | 18 | 23 | 10 | -- | 3 | 68 | -- | -- | -- | -- | -- |
| Hard maple | 3,162 | 26 | 260 | 282 | 22 | 25 | 32 | 31 | 224 | 78 | 29 | 79 |
| Soft maple | 18,397 | 902 | 1,274 | 484 | 658 | 805 | 513 | 284 | 190 | 212 | 247 | 94 |
| Beech | 605 | 25 | -3 | 16 | -- | 3 | -- | -- | 106 | 22 | -- | -- |
| Ash | 11,900 | 260 | 504 | 375 | 574 | 408 | 159 | 72 | 682 | 331 | 317 | 411 |
| Balsam poplar | 245 | -- | -- | 21 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 2,157 | 3 | 23 | 169 | 20 | 13 | 7 | 5 | 7 | 36 | -- | 14 |
| Bigtooth aspen | 3,638 | 640 | 96 | 38 | 37 | 117 | -- | 226 | 11 | 49 | 57 | -- |
| Quaking aspen | 4,906 | 54 | 31 | -- | -- | 100 | 30 | -- | -- | 68 | 10 | -- |
| Basswood | 2,892 | 12 | 109 | 44 | 52 | 515 | 87 | 66 | 187 | 90 | 17 | 27 |
| Yellow-poplar | 400 | 38 | -- | 129 | -- | 133 | 11 | -- | -- | -- | -- | -- |
| Black walnut | 793 | -- | -- | -- | 6 | -- | 81 | 47 | 32 | 7 | -- | 265 |
| Black cherry | 6,856 | 733 | 788 | 570 | 139 | 489 | 441 | 20 | 21 | 288 | -- | 52 |
| Butternut | 92 | -- | -- | 16 | 5 | 8 | 23 | -- | 8 | -- | -- | -- |
| Elm | -3,351 | 10 | -220 | -461 | -294 | -167 | -332 | -50 | -230 | -96 | -16 | -129 |
| Paper birch | 713 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 2,795 | 110 | 49 | 179 | 14 | 28 | 45 | -- | 57 | -- | 10 | 41 |
| Total | 79,112 | 4,640 | 4,664 | 2,430 | 1,462 | 2,856 | 1,503 | 996 | 1,537 | 1,406 | 962 | 880 |
| All species | 87,804 | 6,619 | 5,336 | 2,430 | 1,464 | 2,972 | 1,550 | 996 | 1,563 | 1,406 | 1,046 | 880 |

(Table 44 continued on next page)

(Table 44 continued)

| Species group | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | -- | 11 | -- | -- | 53 | 42 | -- | -- | -- | -- | -- | 440 |
| Red pine | -- | -- | -- | -- | 214 | 23 | 274 | -- | 255 | -- | -- | 229 |
| Jack pine | -- | -- | -- | -- | -- | -- | 4 | -- | -- | -- | -- | 28 |
| White spruce | -- | 21 | -- | -- | 33 | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | 6 | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17 |
| Tamarack | -1 | -- | 3 | -- | -- | -2 | -- | -- | -- | -10 | -- | 43 |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | 16 | -- | 5 |
| Other softwoods | -- | -- | -- | 125 | 258 | 44 | -- | -- | 60 | -- | -- | -- |
| Total | -1 | 32 | 3 | 125 | 558 | 107 | 284 | -- | 315 | 6 | -- | 762 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | -- | 107 | 19 | 284 | 17 | 328 | 231 | 103 | 310 | 90 | 139 | 444 |
| Select red oaks | -- | 73 | 170 | 403 | 94 | 505 | 217 | 63 | 608 | 10 | 120 | 988 |
| Other red oaks | -- | 2 | 8 | 250 | 94 | 767 | 8 | -- | 65 | -- | 67 | 98 |
| Hickory | -- | 63 | 8 | 379 | 54 | 36 | 95 | 118 | 145 | 16 | 142 | 35 |
| Yellow birch | -- | -- | -- | 3 | 15 | -- | 8 | -- | -- | 2 | -- | -- |
| Hard maple | -- | 77 | 24 | -- | 13 | 318 | 123 | 160 | -- | 191 | 18 | 248 |
| Soft maple | 177 | 131 | 97 | 186 | 234 | 1,140 | 964 | 810 | 831 | 324 | 89 | 1,289 |
| Beech | -- | 24 | 42 | -- | 20 | 15 | 6 | -- | -- | 14 | -- | 31 |
| Ash | 362 | 241 | 72 | 314 | 159 | 684 | 174 | 354 | 105 | 31 | 240 | 549 |
| Balsam poplar | 17 | 14 | -- | -- | -- | -- | 16 | -- | -- | -- | -- | -- |
| Cottonwood | 400 | 123 | -- | 17 | 12 | -- | 94 | 238 | -- | 27 | 225 | -- |
| Bigtooth aspen | -- | 16 | 103 | 94 | 140 | 174 | 23 | 20 | 50 | -- | -- | 455 |
| Quaking aspen | 644 | -43 | 55 | -- | 10 | 157 | 754 | 14 | -- | 189 | -- | 348 |
| Basswood | 27 | 91 | 42 | 159 | 4 | 92 | 80 | 156 | 14 | 21 | 111 | 33 |
| Yellow-poplar | -- | -- | -- | -- | 50 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | 32 | 10 | -- | -- | -- | 50 | -- | -- | 63 | -- |
| Black cherry | 63 | 97 | 124 | 444 | 201 | 321 | 37 | 75 | 324 | 4 | 81 | 100 |
| Butternut | -- | -- | -- | -- | -- | 27 | -- | -- | -- | -- | -- | -- |
| Elm | 187 | -80 | 78 | -81 | 88 | -262 | 72 | -63 | -17 | -85 | -117 | -337 |
| Paper birch | 120 | -- | -- | -- | -- | -- | 26 | -- | -- | -- | -- | 91 |
| Other hardwoods | 86 | 58 | 42 | 304 | 44 | 174 | -- | 3 | 9 | 47 | 20 | 128 |
| Total | 2,083 | 994 | 916 | 2,766 | 1,249 | 4,476 | 2,928 | 2,101 | 2,444 | 881 | 1,198 | 4,500 |
| All species | 2,082 | 1,026 | 919 | 2,891 | 1,807 | 4,583 | 3,212 | 2,101 | 2,759 | 887 | 1,198 | 5,262 |

(Table 44 continued on next page)

(Table 44 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 723 | 14 | 172 | 23 | 268 | 22 | -- | -- | 20 | 210 | -- | -- |
| Red pine | 746 | 38 | 462 | -- | -- | -- | -- | -- | -- | 20 | -- | -- |
| Jack pine | 181 | -- | 69 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | 35 | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 49 | -- | 16 | -- | 11 | -- | -- | -- | 7 | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6 | -- |
| Northern white-cedar | 1 | -- | -- | -- | -- | -- | -- | -- | 225 | -- | -- | -- |
| Other softwoods | -- | -- | 181 | 17 | 36 | 11 | -- | -- | -- | 12 | -- | -- |
| Total | 1,700 | 52 | 900 | 40 | 315 | 68 | -- | -- | 252 | 242 | 6 | -- |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 454 | 199 | 185 | 362 | 435 | 53 | 7 | 332 | 43 | 97 | 463 | 213 |
| Select red oaks | 984 | 342 | 402 | 76 | 327 | 290 | 10 | 264 | 96 | 412 | 122 | 226 |
| Other red oaks | 566 | 87 | 87 | 52 | -- | 58 | -- | 11 | -- | 78 | 467 | -- |
| Hickory | 7 | 91 | 9 | 55 | 71 | 271 | -- | 86 | 6 | 93 | 228 | 21 |
| Yellow birch | 7 | -- | 14 | -- | 6 | -- | -- | -- | 4 | 5 | -- | -- |
| Hard maple | 4 | 19 | 81 | 49 | 118 | 21 | -- | 52 | 193 | 69 | 294 | 2 |
| Soft maple | 1,348 | 300 | 561 | 366 | 277 | 381 | 48 | 538 | 1,016 | 979 | 386 | 262 |
| Beech | 199 | 25 | 9 | -- | 11 | -- | 4 | 23 | 10 | 1 | 14 | -12 |
| Ash | 323 | 315 | 144 | 259 | 819 | 150 | 479 | 858 | 203 | 647 | 184 | 141 |
| Balsam poplar | -- | 19 | -- | 9 | -- | -- | 65 | -- | 84 | -- | -- | -- |
| Cottonwood | -- | 15 | 41 | 52 | 291 | -- | 53 | 86 | 86 | 24 | 39 | 37 |
| Bigtooth aspen | 556 | 18 | 77 | 59 | 21 | 225 | 7 | 36 | 150 | 106 | 17 | 20 |
| Quaking aspen | 102 | 83 | 179 | 395 | 410 | 14 | 248 | 28 | 985 | 16 | 11 | 14 |
| Basswood | 1 | 233 | 40 | 6 | 124 | 25 | 31 | 113 | 119 | 34 | 39 | 91 |
| Yellow-poplar | -- | -- | -- | -- | -- | 32 | -- | -- | -- | 7 | -- | -- |
| Black walnut | -- | 11 | -- | -- | -- | 129 | -- | -- | 4 | 14 | 42 | -- |
| Black cherry | 61 | 216 | 48 | 44 | 150 | 180 | 20 | 129 | -31 | 346 | 281 | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | 5 | -- | -- | -- |
| Elm | 120 | -40 | -125 | -50 | -141 | -105 | -26 | -196 | -59 | -154 | 138 | -111 |
| Paper birch | 6 | -- | -- | 255 | -- | -- | 147 | -- | 68 | -- | -- | -- |
| Other hardwoods | 439 | 11 | 52 | 322 | 2 | 19 | 12 | 41 | -- | 155 | 255 | 39 |
| Total | 5,177 | 1,944 | 1,804 | 2,311 | 2,921 | 1,743 | 1,105 | 2,401 | 2,982 | 2,929 | 2,980 | 943 |
| All species | 6,877 | 1,996 | 2,704 | 2,351 | 3,236 | 1,811 | 1,105 | 2,401 | 3,234 | 3,171 | 2,986 | 943 |

Table 45.--Net annual growth of sawtimber on commercial forest land by species group and county, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)1/

| Species group | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Allegan | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 17,855 | 4,497 | -- | -- | -- | -- | -- | -- | -- | -- | 116 | -- |
| Red pine | 7,824 | 206 | 487 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 3,034 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 73 | -- | 73 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 501 | 15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 27 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 208 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 5,058 | 1,114 | -- | -- | 12 | 237 | -- | -- | -- | -- | -- | -- |
| Total | 34,614 | 5,832 | 560 | -- | 12 | 237 | -- | -- | -- | -- | 116 | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 41,911 | 3,305 | 1,160 | 132 | 898 | 1,059 | 255 | 86 | 389 | 779 | 281 | 70 |
| Select red oaks | 54,556 | 2,390 | 4,866 | 1,799 | 57 | 91 | 495 | 377 | 108 | 869 | 1,462 | 18 |
| Other red oaks | 18,922 | 547 | 1,283 | 375 | -- | 376 | -- | 54 | -- | -- | 208 | -- |
| Hickory | 14,894 | 1,496 | 1,724 | 18 | 115 | 543 | 185 | -- | 1,555 | 62 | -- | 127 |
| Yellow birch | 610 | -- | -- | 64 | -- | 15 | 330 | -- | -- | -- | -- | -- |
| Hard maple | 13,659 | 108 | 723 | 449 | -5 | 36 | 158 | 42 | 1,962 | 332 | 86 | 368 |
| Soft maple | 56,995 | 3,432 | 1,415 | 845 | 3,712 | 2,101 | 1,663 | 3,236 | 612 | 1,155 | 764 | 236 |
| Beech | 2,231 | -14 | 7 | 13 | -- | -4 | -29 | -- | 445 | 34 | -- | -- |
| Ash | 27,301 | 1,877 | 317 | -258 | 515 | 2,553 | 294 | 1,471 | 779 | 1,178 | 291 | 723 |
| Balsam poplar | 1,808 | -- | -- | 31 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 8,481 | 13 | 125 | 689 | 98 | 73 | 38 | 27 | 33 | 196 | -- | 69 |
| Bigtooth aspen | 10,950 | 1,378 | 164 | 37 | 79 | 659 | -- | 57 | 77 | -- | 147 | -- |
| Quaking aspen | 8,283 | 107 | -- | -- | -- | 91 | -- | -- | -- | -- | 38 | -- |
| Basswood | 7,500 | 70 | 505 | 210 | 88 | 1,357 | 252 | -- | 328 | 64 | 68 | 151 |
| Yellow-poplar | 737 | 60 | -- | 289 | -- | -- | 15 | -- | -- | -- | -- | -- |
| Black walnut | 2,089 | -- | -- | -- | 15 | -- | 113 | 171 | -- | -2 | -- | 18 |
| Black cherry | 20,384 | 4,040 | 1,159 | 2,572 | 305 | 1,416 | 742 | -- | -- | -- | -- | -- |
| Butternut | 113 | -- | -- | -- | -- | 36 | -- | -- | -- | -- | -- | -- |
| Elm | -1,995 | -702 | -295 | 460 | -236 | -153 | -567 | -19 | 708 | -149 | -- | -181 |
| Paper birch | 524 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 7,688 | 304 | -4 | 881 | -- | 95 | 24 | -- | 159 | -- | 51 | -- |
| Total | 297,641 | 18,411 | 13,149 | 8,606 | 5,641 | 10,344 | 3,968 | 5,502 | 7,155 | 4,518 | 3,396 | 1,599 |
| All species | 332,255 | 24,243 | 13,709 | 8,606 | 5,653 | 10,581 | 3,968 | 5,502 | 7,155 | 4,518 | 3,512 | 1,599 |

(Table 45 continued on next page)

(Table 45 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | -- | 56 | -- | -- | 384 | 202 | -- | -- | -- | -- | -- | 1,956 |
| Red pine | -- | -- | -- | -- | 585 | 149 | -- | -- | 1,070 | -- | -- | 468 |
| Jack pine | -- | -- | -- | -- | -- | -- | 18 | -- | -- | -- | -- | 2 |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | 34 | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 103 |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -36 | -- | 16 |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 |
| Other softwoods | -- | -- | -- | -- | 1,821 | 91 | -- | -- | 340 | -- | -- | -- |
| Total | -- | 56 | -- | -- | 2,790 | 442 | 52 | -- | 1,410 | -36 | -- | 2,558 |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | -- | 1,620 | 77 | 2,068 | 115 | 2,630 | 1,288 | 625 | 1,838 | 633 | 1,790 | 4,015 |
| Select red oaks | -- | 406 | 1,082 | 1,648 | 886 | 1,427 | 1,987 | 211 | 5,363 | 40 | 683 | 3,455 |
| Other red oaks | -- | 11 | 52 | 1,739 | 378 | 5,445 | -- | -- | 284 | -- | 399 | 863 |
| Hickory | -- | 284 | -- | 1,474 | 48 | 118 | 56 | 780 | 2,859 | 102 | 351 | 118 |
| Yellow birch | -- | -- | -- | 20 | -- | -- | -- | -- | -- | 15 | -- | -- |
| Hard maple | -- | 449 | 33 | -- | -- | 1,400 | 397 | 2,531 | -- | 678 | 108 | 23 |
| Soft maple | 35 | 589 | 132 | 396 | 376 | 3,615 | 5,877 | 208 | 1,174 | 930 | 395 | 3,304 |
| Beech | -- | 250 | 10 | -- | 156 | 108 | 5 | -5 | -- | 50 | -- | -12 |
| Ash | 358 | 627 | 154 | 485 | 13 | 475 | 363 | 759 | 394 | 112 | 61 | 980 |
| Balsam poplar | 61 | -- | -- | -- | -- | -- | 1,625 | -- | -- | -- | -- | -8 |
| Cottonwood | 2,727 | 619 | -- | 82 | 64 | -- | -- | 51 | -- | 107 | 642 | -- |
| Bigtooth aspen | -- | 17 | 123 | 279 | 195 | -- | -- | 76 | 148 | -- | -- | 4,072 |
| Quaking aspen | 1,507 | 311 | -- | -- | -- | -- | 39 | 33 | -- | -- | -- | 1,550 |
| Basswood | 227 | 244 | 153 | 104 | -- | 358 | 221 | 179 | 77 | 92 | 152 | 111 |
| Yellow-poplar | -- | -- | -- | -- | 231 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | 54 | -- | -- | -- | -- | -- | -- | 57 | -- |
| Black cherry | 139 | 1 | 72 | 2,963 | 424 | 269 | -- | 98 | 98 | 33 | 178 | 2 |
| Butternut | -- | -- | -- | -- | -- | 68 | -- | -- | -- | -- | -- | -- |
| Elm | 52 | 298 | -- | -16 | -- | -621 | -- | -113 | -- | -- | -- | 348 |
| Paper birch | 50 | -- | -- | -- | -- | -- | 14 | -- | -- | -- | -- | 28 |
| Other hardwoods | -- | 52 | 33 | 106 | 190 | 33 | -- | -- | 47 | 1,354 | 90 | 1,640 |
| Total | 5,156 | 5,778 | 1,921 | 11,402 | 3,076 | 15,325 | 11,872 | 5,433 | 12,282 | 4,146 | 4,906 | 20,489 |
| All species | 5,156 | 5,834 | 1,921 | 11,402 | 5,866 | 15,767 | 11,924 | 5,433 | 13,692 | 4,110 | 4,906 | 23,047 |

(Table continued on next page)

(Table 45 continued)

| Species group | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 6,539 | 79 | 1,622 | 133 | 1,461 | 132 | -- | -- | 112 | 566 | -- | -- |
| Red pine | 3,331 | 114 | 1,414 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 1,941 | -- | 1,073 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 276 | -- | 43 | -- | 64 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 47 | -- |
| Northern white-cedar | 2 | -- | -- | -- | -- | -- | -- | -- | 193 | -- | -- | -- |
| Other softwoods | -- | -- | 1,443 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 12,089 | 193 | 5,595 | 133 | 1,525 | 132 | -- | -- | 305 | 566 | 47 | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 1,810 | 1,187 | 747 | 1,522 | 3,497 | 239 | 40 | 2,012 | 174 | 412 | 3,877 | 1,281 |
| Select red oaks | 4,075 | 1,918 | 4,275 | 403 | 3,590 | 2,892 | -- | 2,443 | 406 | 1,462 | 782 | 2,587 |
| Other red oaks | 3,413 | 503 | 325 | 1,303 | -- | 492 | -- | 70 | -- | 483 | 319 | -- |
| Hickory | -- | 503 | 68 | 175 | -- | 584 | -- | 513 | 46 | 175 | 709 | 106 |
| Yellow birch | -- | -- | 63 | -- | 34 | -- | -- | -- | 69 | -- | -- | -- |
| Hard maple | 1 | 68 | 231 | 259 | 168 | -- | -- | 2,139 | 670 | 152 | 84 | 9 |
| Soft maple | 2,774 | 1,238 | 3,368 | 1,049 | 892 | 2,631 | 166 | 1,635 | 4,361 | 1,302 | 1,046 | 331 |
| Beech | 865 | 175 | 25 | -- | -16 | -- | 30 | 138 | 66 | -13 | 17 | -70 |
| Ash | 183 | 862 | 296 | 1,500 | 4,357 | 393 | 297 | 1,784 | 321 | 642 | 448 | 1,697 |
| Balsam poplar | -- | 11 | -- | 9 | -- | -- | 33 | -- | 46 | -- | -- | -- |
| Cottonwood | -- | -- | 246 | 157 | 1,125 | -- | 150 | 574 | 401 | 124 | 51 | -- |
| Bigtooth aspen | 2,008 | -- | -- | 196 | -- | 764 | 55 | 272 | 89 | 58 | -- | -- |
| Quaking aspen | 166 | 144 | -- | 19 | 152 | -- | 2,874 | 53 | 1,146 | -- | 53 | -- |
| Basswood | 2 | 390 | 230 | 37 | 309 | 120 | -- | 257 | 613 | 162 | 160 | 209 |
| Yellow-poplar | -- | -- | -- | -- | -- | 109 | -- | -- | -- | 33 | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | 1,547 | -- | -- | 7 | -- | 109 | -- |
| Black cherry | 94 | 176 | 4 | -- | 2,329 | 252 | -- | 342 | -34 | 1,301 | 1,409 | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | 9 | -- | -- | -- |
| Elm | 2 | -- | -402 | -- | -30 | -- | -- | -12 | 43 | -727 | 660 | -343 |
| Paper birch | 15 | -- | -- | -- | -- | -- | 62 | -- | 355 | -- | -- | -- |
| Other hardwoods | 67 | -- | 254 | 131 | -- | -- | 64 | 299 | -- | 1,320 | 376 | 122 |
| Total | 15,475 | 7,175 | 9,730 | 6,760 | 16,407 | 10,023 | 3,771 | 12,519 | 8,788 | 6,886 | 10,100 | 5,929 |
| All species | 27,564 | 7,368 | 15,325 | 6,893 | 17,932 | 10,155 | 3,771 | 12,519 | 9,093 | 7,452 | 10,147 | 5,929 |

Table 46.--Net annual growth of growing stock on commercial forest land by species group and ownership class, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 2,766 | 6 | -- | -- | -- | 380 | 78 | -- | 571 | 109 | 1,622 |
| Red pine | 3,181 | 93 | -- | -- | -- | 1,080 | 576 | -- | 38 | 359 | 1,035 |
| Jack pine | 586 | 15 | -- | -- | -- | 321 | 30 | -- | -- | 16 | 204 |
| White spruce | 507 | -- | -- | -- | -- | -- | -- | -- | 56 | -- | 451 |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 6 | -- | -- | -- | -- | 6 | -- | -- | -- | -- | -- |
| Hemlock | 104 | 1 | -- | -- | -- | 11 | 41 | -- | 7 | 8 | 36 |
| Tamarack | 39 | -- | -- | -- | -- | 5 | -- | -- | -1 | 33 | 2 |
| Northern white-cedar | 247 | 2 | -- | -- | -- | 4 | -- | -- | 237 | -- | 4 |
| Other softwoods | 1,256 | -- | -- | -- | -- | -- | -- | -- | 141 | 122 | 993 |
| Total | 8,692 | 117 | -- | -- | -- | 1,807 | 725 | -- | 1,049 | 647 | 4,347 |
| HARDWOODS | | | | | | | | | | | |
| Select white oak | 6,892 | 51 | -- | 94 | -- | 733 | 54 | -- | 3,196 | 162 | 2,602 |
| Select red oaks | 9,190 | 17 | -- | -- | -- | 773 | 327 | -- | 3,404 | 679 | 3,990 |
| Other red oaks | 3,823 | 72 | -- | -- | -- | 418 | 18 | -- | 1,270 | 188 | 1,857 |
| Hickory | 2,821 | -- | -- | -- | -- | 215 | 26 | -- | 1,644 | 35 | 901 |
| Yellow birch | 186 | -- | -- | -- | -- | 14 | -- | -- | 52 | 7 | 113 |
| Hard maple | 3,162 | 1 | -- | -- | -- | 35 | 13 | -- | 2,077 | 99 | 937 |
| Soft maple | 18,397 | 33 | -- | 16 | -- | 1,224 | 147 | -- | 9,391 | 1,444 | 6,142 |
| Beech | 605 | -- | -- | -- | -- | 6 | -- | -- | 271 | 199 | 129 |
| Ash | 11,900 | 2 | -- | -- | -- | 340 | 72 | -- | 7,442 | 344 | 3,700 |
| Balsam poplar | 245 | -- | -- | -- | -- | -- | -- | -- | 230 | -- | 15 |
| Cottonwood | 2,157 | -- | -- | -- | -- | 42 | -- | -- | 1,394 | 175 | 546 |
| Bigtooth aspen | 3,638 | 9 | -- | -- | -- | 713 | 67 | -- | 839 | 14 | 1,996 |
| Quaking aspen | 4,906 | -3 | -- | -- | -- | 331 | 44 | -- | 2,761 | 249 | 1,524 |
| Basswood | 2,892 | 3 | -- | -- | -- | 12 | 35 | -- | 1,702 | 90 | 1,050 |
| Yellow-poplar | 400 | -- | -- | -- | -- | -- | -- | -- | 174 | 3 | 223 |
| Black walnut | 793 | -- | -- | -- | -- | -- | -- | -- | 300 | 11 | 482 |
| Black cherry | 6,856 | 4 | -- | -- | -- | 913 | 288 | -- | 3,143 | 244 | 2,264 |
| Butternut | 92 | -- | -- | -- | -- | -- | 8 | -- | 46 | 7 | 31 |
| Elm | -3,351 | 2 | -- | -- | -- | -37 | -40 | -- | -1,585 | -311 | -1,380 |
| Paper birch | 713 | 2 | -- | -- | -- | 40 | -- | -- | 407 | 5 | 259 |
| Other hardwoods | 2,795 | -- | -- | -- | -- | 75 | 63 | -- | 1,039 | 123 | 1,495 |
| Total | 79,112 | 193 | -- | 110 | -- | 5,847 | 1,122 | -- | 39,197 | 3,767 | 28,876 |
| All species | 87,804 | 310 | -- | 110 | -- | 7,654 | 1,847 | -- | 40,246 | 4,414 | 33,223 |

Table 47.--Net annual growth of sawtimber on commercial forest land by species group and ownership class, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 17,855 | 33 | -- | -- | -- | 3,035 | 203 | -- | 2,693 | 590 | 11,301 |
| Red pine | 7,824 | 209 | -- | -- | -- | 2,327 | 2,578 | -- | 114 | 370 | 2,226 |
| Jack pine | 3,034 | 30 | -- | -- | -- | 18 | -- | -- | -- | -- | 2,986 |
| White spruce | 73 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 73 |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 34 | -- | -- | -- | -- | 34 | -- | -- | -- | -- | -- |
| Hemlock | 501 | 3 | -- | -- | -- | 64 | 250 | -- | -- | 23 | 161 |
| Tamarack | 27 | -- | -- | -- | -- | 17 | -- | -- | 10 | -- | -- |
| Northern white-cedar | 208 | 7 | -- | -- | -- | 9 | -- | -- | 94 | -- | 98 |
| Other softwoods | 5,058 | -- | -- | -- | -- | -- | -- | -- | 1,132 | 276 | 3,650 |
| Total | 34,614 | 282 | -- | -- | -- | 5,504 | 3,031 | -- | 4,043 | 1,259 | 20,495 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 41,911 | 261 | -- | 591 | -- | 5,518 | 91 | -- | 21,425 | 754 | 13,271 |
| Select red oaks | 54,556 | 64 | -- | -- | -- | 5,692 | 2,177 | -- | 22,725 | 3,152 | 20,746 |
| Other red oaks | 18,922 | 369 | -- | -- | -- | 1,231 | -- | -- | 4,885 | 1,176 | 11,261 |
| Hickory | 14,894 | -- | -- | -- | -- | 1,582 | 26 | -- | 8,608 | 57 | 4,621 |
| Yellow birch | 610 | -- | -- | -- | -- | -- | -- | -- | 164 | -- | 446 |
| Hard maple | 13,659 | 1 | -- | -- | -- | 129 | -- | -- | 8,631 | 336 | 4,562 |
| Soft maple | 56,995 | 97 | -- | 219 | -- | 6,299 | 295 | -- | 24,339 | 4,113 | 21,633 |
| Beech | 2,231 | -- | -- | -- | -- | -- | -- | -- | 1,022 | 878 | 331 |
| Ash | 27,301 | 8 | -- | -- | -- | 327 | 313 | -- | 16,271 | 736 | 9,646 |
| Balsam poplar | 1,808 | -- | -- | -- | -- | -- | -- | -- | 1,799 | -- | 9 |
| Cottonwood | 8,481 | -- | -- | -- | -- | 176 | -- | -- | 6,234 | 416 | 1,655 |
| Bigtooth aspen | 10,950 | 25 | -- | -- | -- | 160 | 136 | -- | 6,552 | -- | 4,077 |
| Quaking aspen | 8,283 | 23 | -- | -- | -- | 662 | 59 | -- | 5,766 | 28 | 1,745 |
| Basswood | 7,500 | 5 | -- | -- | -- | 70 | 43 | -- | 3,964 | 496 | 2,922 |
| Yellow-poplar | 737 | -- | -- | -- | -- | -- | -- | -- | 549 | -5 | 193 |
| Black walnut | 2,089 | -- | -- | -- | -- | -- | -- | -- | 380 | -- | 1,709 |
| Black cherry | 20,384 | 15 | -- | -- | -- | 3,046 | -- | -- | 9,487 | 661 | 7,175 |
| Butternut | 113 | -- | -- | -- | -- | -- | 36 | -- | 9 | 68 | -- |
| Elm | -1,995 | 2 | -- | -- | -- | 617 | -- | -- | 59 | 200 | -2,873 |
| Paper birch | 524 | 16 | -- | -- | -- | 13 | -- | -- | 495 | -- | -- |
| Other hardwoods | 7,688 | -- | -- | -- | -- | -- | 1,476 | -- | 3,059 | 289 | 2,864 |
| Total | 297,641 | 886 | -- | 810 | -- | 25,522 | 4,652 | -- | 146,423 | 13,355 | 105,993 |
| All species | 332,255 | 1,168 | -- | 810 | -- | 31,026 | 7,683 | -- | 150,466 | 14,614 | 126,488 |

[1] International 1/4-inch rule.

Table 48.--Net annual growth of growing stock on commercial forest land by species group and forest type, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| | | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All types | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 2,766 | -- | 121 | 941 | -- | -- | -- | 9 |
| Red pine | 3,181 | -- | 2,485 | 116 | -- | -- | -- | -- |
| Jack pine | 586 | 442 | 68 | -- | -- | -- | -- | -- |
| White spruce | 507 | -- | -- | -- | -- | 452 | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 6 | -- | 6 | -- | -- | -- | -- | -- |
| Hemlock | 104 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 39 | -- | -- | -- | -- | -- | -- | 5 |
| Northern white-cedar | 247 | -- | -- | -- | -- | -- | -- | 225 |
| Other softwoods | 1,256 | -- | 21 | 55 | -- | 68 | -- | -- |
| Total | 8,692 | 442 | 2,701 | 1,112 | -- | 520 | -- | 239 |
| HARDWOODS | | | | | -- | | | |
| Select white oaks | 6,892 | -- | 17 | 1 | -- | -- | -- | -- |
| Select red oaks | 9,190 | 126 | 12 | 49 | -- | -- | -- | -- |
| Other red oaks | 3,823 | 1 | -- | -- | -- | -- | -- | -- |
| Hickory | 2,821 | 7 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 186 | -- | -- | -- | -- | -- | -- | 7 |
| Hard maple | 3,162 | -- | -- | -- | -- | -- | -- | 51 |
| Soft maple | 18,397 | 43 | 1 | 13 | -- | -- | -- | -- |
| Beech | 605 | -- | -- | -- | -- | -- | -- | -- |
| Ash | 11,900 | -- | -- | -- | -- | -- | -- | 25 |
| Balsam poplar | 245 | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 2,157 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 3,638 | -- | 8 | -- | -- | -- | -- | -- |
| Quaking aspen | 4,906 | -- | -5 | -- | -- | -- | -- | 113 |
| Basswood | 2,892 | -- | -- | -- | -- | -- | -- | 19 |
| Yellow-poplar | 400 | -- | 23 | -- | -- | -- | -- | -- |
| Black walnut | 793 | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 6,856 | -- | -- | 390 | -- | 55 | -- | -- |
| Butternut | 92 | -- | -- | -- | -- | -- | -- | 5 |
| Elm | -3,351 | -- | -- | -- | -- | -- | -- | 5 |
| Paper birch | 713 | -- | -- | -- | -- | -- | -- | 4 |
| Other hardwoods | 2,795 | 7 | -- | -- | -- | -- | -- | -- |
| Total | 79,112 | 184 | 56 | 453 | -- | 55 | -- | 229 |
| All species | 87,804 | 626 | 2,757 | 1,565 | -- | 575 | -- | 468 |

(Table 48 continued on next page)

(Table 48 continued)

| Species group | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | -- | 485 | 50 | 883 | 199 | -- | 78 | -- |
| Red pine | -- | 206 | 50 | 174 | 89 | -- | 61 | -- |
| Jack pine | -- | 70 | -- | -- | -- | -- | 6 | -- |
| White spruce | -- | 34 | -- | 21 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | 11 | 7 | 86 | -- | -- | -- | -- |
| Tamarack | 2 | -- | 42 | -10 | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | 1 | 16 | 1 | 4 | -- | -- |
| Other softwoods | -- | 63 | 27 | 361 | -- | -- | 661 | -- |
| Total | 2 | 869 | 177 | 1,531 | 289 | 4 | 806 | -- |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 4,965 | 659 | 1,156 | 94 | -- | -- | -- |
| Select red oaks | -- | 6,222 | 230 | 2,104 | 394 | -- | 53 | -- |
| Other red oaks | -- | 3,376 | 86 | 315 | 35 | -- | 10 | -- |
| Hickory | -- | 1,698 | 89 | 1,010 | 17 | -- | -- | -- |
| Yellow birch | -- | 7 | 61 | 111 | -- | -- | -- | -- |
| Hard maple | -- | 392 | 26 | 2,693 | -- | -- | -- | -- |
| Soft maple | -- | 2,350 | 9,624 | 5,839 | 527 | -- | -- | -- |
| Beech | -- | 55 | 12 | 526 | 12 | -- | -- | -- |
| Ash | -- | 811 | 3,789 | 7,098 | 177 | -- | -- | -- |
| Balsam poplar | -- | 3 | 34 | 66 | 142 | -- | -- | -- |
| Cottonwood | -- | 331 | 979 | 571 | 276 | -- | -- | -- |
| Bigtooth aspen | -- | 821 | 64 | 985 | 1,760 | -- | -- | -- |
| Quaking aspen | -- | 868 | 788 | 775 | 2,317 | 27 | 23 | -- |
| Basswood | -- | 339 | 487 | 1,961 | 8 | 51 | -- | 27 |
| Yellow-poplar | -- | 28 | 11 | 338 | -- | -- | -- | -- |
| Black walnut | -- | 326 | 307 | 160 | -- | -- | -- | -- |
| Black cherry | -- | 1,757 | 736 | 3,757 | 161 | -- | -- | -- |
| Butternut | -- | 20 | 14 | 53 | -- | -- | -- | -- |
| Elm | -- | -21 | -1,579 | -1,641 | -127 | -- | -- | 12 |
| Paper birch | -- | 93 | 158 | 246 | 212 | -- | -- | -- |
| Other hardwoods | -- | 135 | 1,334 | 1,313 | 6 | -- | -- | -- |
| Total | -- | 24,576 | 17,909 | 29,436 | 6,011 | 78 | 86 | 39 |
| All species | 2 | 25,445 | 18,086 | 30,967 | 6,300 | 82 | 892 | 39 |

## Table 49.--Net annual growth of sawtimber on commercial forest land by species group and forest type, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)1/

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 17,855 | -- | 1,242 | 4,467 | -- | -- | -- | 44 |
| Red pine | 7,824 | 1 | 5,904 | 268 | -- | -- | -- | -- |
| Jack pine | 3,034 | 1,765 | 1,081 | -- | -- | -- | -- | -- |
| White spruce | 73 | -- | -- | -- | -- | 73 | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 34 | -- | 34 | -- | -- | -- | -- | -- |
| Hemlock | 501 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 27 | -- | -- | -- | -- | -- | -- | 16 |
| Northern white-cedar | 208 | -- | -- | -- | -- | -- | -- | 103 |
| Other softwoods | 5,058 | -- | 52 | 315 | -- | 1,450 | -- | -- |
| Total | 34,614 | 1,766 | 8,313 | 5,050 | -- | 1,523 | -- | 163 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 41,911 | -- | 105 | -- | -- | -- | -- | -- |
| Select red oaks | 54,556 | 656 | 916 | 25 | -- | -- | -- | -- |
| Other red oaks | 18,922 | 3 | 1 | -- | -- | -- | -- | -- |
| Hickory | 14,894 | 1,365 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 610 | -- | -- | -- | -- | -- | -- | 69 |
| Hard maple | 13,659 | -- | -- | -- | -- | -- | -- | 354 |
| Soft maple | 56,995 | -- | 1 | 68 | -- | -- | -- | -- |
| Beech | 2,231 | -- | -- | -- | -- | -- | -- | -- |
| Ash | 27,301 | -- | -- | -- | -- | -- | -- | 156 |
| Balsam poplar | 1,808 | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 8,481 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 10,950 | -- | -- | -- | -- | -- | -- | -- |
| Quaking aspen | 8,283 | -- | -- | -- | -- | -- | -- | 1 |
| Basswood | 7,500 | -- | -- | -- | -- | -- | -- | 161 |
| Yellow-poplar | 737 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 2,089 | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 20,384 | -- | 4 | 779 | -- | 48 | -- | -- |
| Butternut | 113 | -- | -- | -- | -- | -- | -- | 9 |
| Elm | -1,995 | -- | -- | -- | -- | -- | -- | 54 |
| Paper birch | 524 | -- | -- | -- | -- | -- | -- | 13 |
| Other hardwoods | 7,688 | -- | -- | -- | -- | -- | -- | -- |
| Total | 297,641 | 2,024 | 1,027 | 872 | -- | 48 | -- | 817 |
| All species | 332,255 | 3,790 | 9,340 | 5,922 | -- | 1,571 | -- | 980 |

(Table 49 continued on next page)

(Table 49 continued)

| | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | -- | 6,282 | 294 | 4,168 | 1,067 | -- | 291 | -- |
| Red pine | -- | 565 | 102 | 367 | 568 | -- | 49 | -- |
| Jack pine | -- | 160 | -- | -- | -- | -- | 28 | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | 66 | 1 | 434 | -- | -- | -- | -- |
| Tamarack | -- | -- | 47 | -36 | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | 6 | -- | -- | 99 | -- | -- |
| Other softwoods | -- | 351 | -- | 2,236 | -- | -- | 654 | -- |
| Total | -- | 7,424 | 450 | 7,169 | 1,635 | 99 | 1,022 | -- |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 28,771 | 1,878 | 10,616 | 541 | -- | -- | -- |
| Select red oaks | -- | 36,602 | 1,051 | 14,164 | 1,142 | -- | -- | -- |
| Other red oaks | -- | 16,464 | 822 | 1,546 | 86 | -- | -- | -- |
| Hickory | -- | 10,244 | 362 | 2,861 | 62 | -- | -- | -- |
| Yellow birch | -- | -- | 27 | 514 | -- | -- | -- | -- |
| Hard maple | -- | 1,835 | 235 | 11,235 | -- | -- | -- | -- |
| Soft maple | -- | 6,278 | 36,814 | 13,333 | 501 | -- | -- | -- |
| Beech | -- | 295 | -14 | 1,950 | -- | -- | -- | -- |
| Ash | -- | 1,519 | 9,252 | 16,031 | 343 | -- | -- | -- |
| Balsam poplar | -- | 9 | 1,654 | 23 | 122 | -- | -- | -- |
| Cottonwood | -- | 578 | 4,460 | 2,167 | 1,276 | -- | -- | -- |
| Bigtooth aspen | -- | 2,625 | 129 | 1,945 | 6,251 | -- | -- | -- |
| Quaking aspen | -- | 69 | 2,060 | 2,224 | 3,929 | -- | -- | -- |
| Basswood | -- | 360 | 1,697 | 4,965 | 20 | 71 | -- | 226 |
| Yellow-poplar | -- | 109 | 15 | 613 | -- | -- | -- | -- |
| Black walnut | -- | 1,888 | 58 | 143 | -- | -- | -- | -- |
| Black cherry | -- | 5,335 | 2,679 | 11,355 | 184 | -- | -- | -- |
| Butternut | -- | 0 | 36 | 68 | -- | -- | -- | -- |
| Elm | -- | 301 | -557 | -1,796 | -49 | -- | -- | 52 |
| Paper birch | -- | 29 | 119 | 137 | 226 | -- | -- | -- |
| Other hardwoods | -- | 265 | 6,770 | 653 | -- | -- | -- | -- |
| Total | -- | 113,576 | 69,547 | 94,747 | 14,634 | 71 | -- | 278 |
| All species | -- | 121,000 | 69,997 | 101,916 | 16,269 | 170 | 1,022 | 278 |

Table 50.--Net annual growth of growing stock on commercial forest land by forest type and stand-age class, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 626 | 156 | -- | 1 | 5 | 295 | -- | 169 | -- | -- | -- | -- | -- | -- |
| Red pine | 2,757 | 2 | 564 | 577 | 606 | 1,008 | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 1,565 | -- | -- | 97 | -- | 751 | -- | 315 | 402 | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 575 | -- | -- | -- | 575 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 468 | 113 | -- | 197 | -- | -- | -- | -- | 146 | -- | -- | 12 | -- | -- |
| Tamarack | 2 | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 25,445 | 959 | 1,089 | 63 | 1,697 | 3,352 | 2,907 | 1,332 | 4,739 | 3,619 | 1,250 | 3,817 | 536 | 85 |
| Elm-ash-soft maple | 18,086 | 687 | 859 | 2,131 | 2,352 | 2,541 | 2,341 | 1,506 | 1,462 | 2,199 | 621 | 1,328 | 59 | -- |
| Maple-birch | 30,967 | 3,817 | 2,941 | 2,036 | 3,906 | 3,636 | 1,742 | 3,558 | 2,310 | 2,593 | 1,899 | 2,009 | 520 | -- |
| Aspen | 6,300 | 859 | 1,610 | 338 | 1,096 | 781 | 478 | 957 | 181 | -- | -- | -- | -- | -- |
| Paper birch | 82 | -- | -- | -- | 82 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Exotic | 892 | 125 | 34 | 323 | 158 | -- | 252 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 39 | -- | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 87,804 | 6,720 | 7,136 | 5,763 | 10,477 | 12,364 | 7,720 | 7,837 | 9,240 | 8,411 | 3,770 | 7,166 | 1,115 | 85 |

Table 51.--Net annual growth of sawtimber on commercial forest land by forest type and stand-age class, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 3,790 | 656 | -- | 1 | 2 | 1,367 | -- | 1,764 | -- | -- | -- | -- | -- | -- |
| Red pine | 9,340 | 9 | 119 | 1,437 | 716 | 7,059 | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 5,922 | -- | -- | 184 | -- | 1,596 | -- | 1,069 | 3,073 | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 1,571 | -- | -- | -- | 1,571 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 980 | 836 | -- | 44 | -- | -- | -- | -- | 58 | -- | -- | 42 | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 121,000 | 4,029 | 3,989 | 495 | 6,940 | 11,721 | 9,262 | 8,012 | 28,780 | 16,970 | 4,019 | 21,493 | 4,753 | 537 |
| Elm-ash-soft maple | 69,997 | 3,353 | 679 | 3,541 | 7,285 | 6,655 | 12,259 | 7,702 | 5,658 | 8,611 | 1,972 | 11,811 | 471 | -- |
| Maple-birch | 101,916 | 8,279 | 8,541 | 3,434 | 6,562 | 8,896 | 8,989 | 13,825 | 7,689 | 8,494 | 12,869 | 9,332 | 5,006 | -- |
| Aspen | 16,269 | 724 | 880 | 532 | 1,775 | 3,151 | 1,986 | 6,705 | 516 | -- | -- | -- | -- | -- |
| Paper birch | 170 | -- | 99 | -- | 71 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Exotic | 1,022 | -- | -- | 42 | -- | -- | 980 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 278 | -- | 278 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 332,255 | 17,886 | 14,585 | 9,710 | 24,922 | 40,445 | 33,476 | 39,077 | 45,774 | 34,075 | 18,860 | 42,678 | 10,230 | 537 |

[1] International 1/4-inch rule.

Table 52.--Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | | |
| Sawtimber | 169 | -- | -- | -- | -- | -- | -- | -- | -- | 169 | -- | -- | -- | -- | -- |
| Poletimber | 295 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 295 | -- | -- | -- |
| Sapling & seedling | 162 | -- | -- | -- | -- | 1 | -- | -- | 159 | -- | -- | -- | 2 | -- | -- |
| All stands | 626 | -- | -- | -- | -- | 1 | -- | -- | 159 | 169 | -- | 295 | 2 | -- | -- |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 861 | -- | -- | -- | -- | -- | -- | -- | -- | 255 | -- | 6 | 591 | -- | 9 |
| Poletimber | 1,863 | -- | -- | -- | -- | -- | -- | 552 | 167 | 8 | -- | 834 | 299 | 1 | 2 |
| Sapling & seedling | 33 | 2 | -- | -- | -- | 1 | -- | 11 | -- | 19 | -- | -- | -- | -- | -- |
| All stands | 2,757 | 2 | -- | -- | -- | 1 | -- | 563 | 167 | 282 | -- | 840 | 890 | 1 | 11 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 853 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 135 | -- | 718 | -- |
| Poletimber | 683 | -- | -- | -- | -- | -- | -- | 69 | -- | -- | -- | -- | 614 | -- | -- |
| Sapling & seedling | 29 | -- | -- | 29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,565 | -- | -- | 29 | -- | -- | -- | 69 | -- | -- | -- | 135 | 614 | 718 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 575 | -- | -- | -- | -- | -- | -- | 419 | -- | 156 | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 575 | -- | -- | -- | -- | -- | -- | 419 | -- | 156 | -- | -- | -- | -- | -- |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 158 | -- | -- | -- | -- | -- | -- | 146 | -- | -- | -- | -- | 12 | -- | -- |
| Sapling & seedling | 310 | 113 | -- | -- | -- | -- | -- | -- | 197 | -- | -- | -- | -- | -- | -- |
| All stands | 468 | 113 | -- | -- | -- | -- | -- | 146 | 197 | -- | -- | -- | 12 | -- | -- |

(Table 52 continued on next page)

(Table 52 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 2 | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2 | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 15,003 | -- | -- | 58 | 62 | 466 | 957 | 1,004 | 1,575 | 1,895 | 1,029 | 3,402 | 4,079 | 476 | -- |
| Poletimber | 8,395 | -- | -- | -- | -- | 299 | 966 | 796 | 1,134 | 1,078 | 1,157 | 1,415 | 1,220 | -- | 330 |
| Sapling & seedling | 2,047 | -- | 16 | 3 | 676 | 710 | 268 | 372 | -- | 1 | 1 | -- | -- | -- | -- |
| All stands | 25,445 | -- | 16 | 61 | 738 | 1,475 | 2,191 | 2,172 | 2,709 | 2,974 | 2,187 | 4,817 | 5,299 | 476 | 330 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 7,782 | -- | -- | 16 | 123 | 383 | 293 | 631 | 1,709 | 1,159 | 240 | 1,650 | 1,325 | 253 | -- |
| Poletimber | 8,641 | -- | 193 | 57 | 320 | 1,207 | 17 | 1,438 | 1,758 | 391 | 2,448 | 806 | 6 | -- | -- |
| Sapling & seedling | 1,663 | 4 | 23 | 11 | 663 | 218 | 344 | 97 | 303 | -- | -- | -- | -- | -- | -- |
| All stands | 18,086 | 4 | 216 | 84 | 1,106 | 1,808 | 654 | 2,166 | 3,770 | 1,550 | 2,688 | 2,456 | 1,331 | 253 | -- |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 12,626 | -- | -- | -- | 71 | 234 | 313 | 2,145 | 1,715 | 1,443 | 2,269 | 1,356 | 2,411 | 669 | -- |
| Poletimber | 10,546 | -- | -- | 85 | 429 | 0 | 248 | 1,731 | 1,980 | 1,441 | 1,957 | 2,177 | 498 | -- | -- |
| Sapling & seedling | 7,795 | 33 | 839 | 337 | 921 | 798 | 882 | 1,683 | 685 | 973 | 233 | 281 | 130 | -- | -- |
| All stands | 30,967 | 33 | 839 | 422 | 1,421 | 1,032 | 1,443 | 5,559 | 4,380 | 3,857 | 4,459 | 3,814 | 3,039 | 669 | -- |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 958 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 262 | -- | 696 | -- | -- |
| Poletimber | 2,874 | -- | -- | -- | 850 | 486 | 572 | 106 | 533 | 8 | -- | -- | 319 | -- | -- |
| Sapling & seedling | 2,468 | -65 | 16 | 130 | 280 | 698 | 111 | 148 | 2 | 258 | 890 | -- | -- | -- | -- |
| All stands | 6,300 | -65 | 16 | 130 | 1,130 | 1,184 | 683 | 254 | 535 | 266 | 1,152 | -- | 1,015 | -- | -- |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 82 | -- | -- | -- | -- | -- | -- | -- | 82 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 82 | -- | -- | -- | -- | -- | -- | -- | 82 | -- | -- | -- | -- | -- | -- |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | 252 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 252 | -- | -- | -- |
| Poletimber | 449 | -- | -- | -- | -- | -- | 158 | -- | -- | -- | -- | -- | 291 | -- | -- |
| Sapling & seedling | 191 | -- | -- | -- | -- | -- | -- | 66 | 125 | -- | -- | -- | -- | -- | -- |
| All stands | 892 | -- | -- | -- | -- | -- | 158 | 66 | 125 | -- | -- | 252 | 291 | -- | -- |
| Nonstocked | 39 | -- | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 38,504 | -- | -- | 74 | 256 | 1,083 | 1,563 | 3,780 | 4,999 | 4,921 | 3,800 | 6,801 | 9,102 | 2,116 | 9 |
| Poletimber | 34,561 | -- | 193 | 142 | 1,599 | 1,992 | 1,961 | 5,257 | 5,654 | 3,082 | 5,562 | 5,527 | 3,259 | 1 | 332 |
| Sapling & seedling | 14,700 | 87 | 894 | 510 | 2,542 | 2,426 | 1,605 | 2,377 | 1,471 | 1,251 | 1,124 | 281 | 132 | -- | -- |
| Nonstocked | 39 | -- | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 87,804 | 87 | 1,126 | 726 | 4,397 | 5,501 | 5,129 | 11,414 | 12,124 | 9,254 | 10,486 | 12,609 | 12,493 | 2,117 | 341 |

Table 53.--Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)1/

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | | |
| Sawtimber | 1,764 | -- | -- | -- | -- | -- | -- | -- | -- | 1,764 | -- | -- | -- | -- | -- |
| Poletimber | 1,367 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,366 | 1 | -- | -- |
| Sapling & seedling | 659 | -- | -- | -- | 1 | -- | -- | -- | 658 | -- | -- | -- | -- | -- | -- |
| All stands | 3,790 | -- | -- | -- | 1 | -- | -- | -- | 658 | 1,764 | -- | 1,366 | 1 | -- | -- |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 6,848 | -- | -- | -- | -- | -- | -- | -- | -- | 1,070 | -- | 41 | 5,678 | -- | 59 |
| Poletimber | 2,440 | -- | -- | -- | -- | -- | -- | 98 | 317 | 8 | -- | 1,954 | 54 | 5 | 4 |
| Sapling & seedling | 52 | 9 | -- | -- | -- | 4 | -- | 17 | -- | 22 | -- | -- | -- | -- | -- |
| All stands | 9,340 | 9 | -- | -- | -- | 4 | -- | 115 | 317 | 1,100 | -- | 1,995 | 5,732 | 5 | 63 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 4,959 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 817 | -- | 4,142 | -- |
| Poletimber | 804 | -- | -- | -- | -- | -- | -- | 25 | -- | -- | -- | -- | 779 | -- | -- |
| Sapling & seedling | 159 | -- | -- | 159 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 5,922 | -- | -- | 159 | -- | -- | -- | 25 | -- | -- | -- | 817 | 779 | 4,142 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1,571 | -- | -- | -- | -- | -- | -- | 73 | -- | 1,498 | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,571 | -- | -- | -- | -- | -- | -- | 73 | -- | 1,498 | -- | -- | -- | -- | -- |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 99 | -- | -- | -- | -- | -- | -- | 57 | -- | -- | -- | -- | 42 | -- | -- |
| Sapling & seedling | 881 | 837 | -- | -- | -- | -- | -- | -- | 44 | -- | -- | -- | -- | -- | -- |
| All stands | 980 | 837 | -- | -- | -- | -- | -- | 57 | 44 | -- | -- | -- | 42 | -- | -- |

(Table 53 continued on next page)

(Table 53 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 84,063 | -- | -- | 270 | 531 | 2,470 | 6,656 | 2,916 | 7,720 | 10,000 | 5,805 | 17,114 | 27,147 | 3,434 | -- |
| Poletimber | 28,921 | -- | -- | -- | -- | 483 | 1,536 | 5,286 | 4,901 | 3,525 | 1,159 | 8,285 | 2,560 | -- | 1,186 |
| Sapling & seedling | 8,016 | -- | 39 | 4 | 1,968 | 3,152 | 395 | 2,454 | -- | 1 | 3 | -- | -- | -- | -- |
| All stands | 121,000 | -- | 39 | 274 | 2,499 | 6,105 | 8,587 | 10,656 | 12,621 | 13,526 | 6,967 | 25,399 | 29,707 | 3,434 | 1,186 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 44,750 | -- | -- | 1,800 | 2,904 | 1,999 | 1,273 | 5,607 | 10,505 | 4,981 | 1,004 | 6,194 | 6,184 | 2,299 | -- |
| Poletimber | 21,054 | -- | 71 | 33 | 3,080 | 1,704 | 344 | 4,396 | 2,581 | 496 | 7,708 | 606 | 35 | -- | -- |
| Sapling & seedling | 4,193 | 302 | 11 | 44 | 496 | 614 | 1,956 | 391 | 379 | -- | -- | -- | -- | -- | -- |
| All stands | 69,997 | 302 | 82 | 1,877 | 6,480 | 4,317 | 3,573 | 10,394 | 13,465 | 5,477 | 8,712 | 6,800 | 6,219 | 2,299 | -- |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 59,335 | -- | -- | -- | 290 | 1,831 | 868 | 4,940 | 9,623 | 4,680 | 11,378 | 7,924 | 11,899 | 5,902 | -- |
| Poletimber | 24,899 | -- | -- | 130 | 91 | -- | 1,659 | 4,187 | 4,478 | 1,331 | 8,445 | 2,546 | 2,032 | -- | -- |
| Sapling & seedling | 17,682 | 82 | 965 | 963 | 3,498 | 2,771 | 103 | 3,412 | 2,360 | 2,490 | 511 | 155 | 372 | -- | -- |
| All stands | 101,916 | 82 | 965 | 1,093 | 3,879 | 4,602 | 2,630 | 12,539 | 16,461 | 8,501 | 20,334 | 10,625 | 14,303 | 5,902 | -- |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 6,706 | -- | -- | -- | 1 | -- | -- | -- | -- | -- | 1,834 | -- | 4,871 | -- | -- |
| Poletimber | 7,959 | -- | -- | -- | 359 | 693 | 1,380 | 72 | 3,469 | 31 | -- | -- | 1,955 | -- | -- |
| Sapling & seedling | 1,604 | -332 | -- | 437 | -- | 918 | 146 | 97 | -- | 226 | 112 | -- | -- | -- | -- |
| All stands | 16,269 | -332 | -- | 437 | 360 | 1,611 | 1,526 | 169 | 3,469 | 257 | 1,946 | -- | 6,826 | -- | -- |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 71 | -- | -- | -- | -- | -- | -- | -- | 71 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 99 | -- | -- | -- | -- | -- | 99 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 170 | -- | -- | -- | -- | -- | 99 | -- | 71 | -- | -- | -- | -- | -- | -- |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | 980 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 980 | -- | -- | -- |
| Poletimber | 42 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 42 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,022 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 980 | 42 | -- | -- |
| Nonstocked | 278 | -- | 278 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 209,405 | -- | -- | 2,070 | 3,726 | 6,300 | 8,797 | 13,463 | 27,848 | 22,495 | 20,021 | 33,070 | 55,779 | 15,777 | 59 |
| Poletimber | 33,345 | 898 | 1,015 | 1,607 | 5,963 | 7,459 | 2,699 | 6,371 | 3,441 | 2,739 | 626 | 155 | 372 | -- | -- |
| Spling & seedling | 89,227 | -- | 71 | 163 | 3,530 | 2,880 | 4,919 | 14,194 | 15,817 | 6,889 | 17,312 | 14,757 | 7,500 | 5 | 1,190 |
| Nonstocked | 278 | -- | 278 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 332,255 | 898 | 1,364 | 3,840 | 13,219 | 16,639 | 16,415 | 34,028 | 47,106 | 32,123 | 37,959 | 47,982 | 63,651 | 15,782 | 1,249 |

[1]/International 1/4-inch rule.

Table 54.--Timber removals[1] from growing stock on commercial forest land by species group and county, Southern Upper Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | All counties | County | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alegen | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 125 | 27 | -- | -- | -- | -- | -- | -- | 7 | -- | -- | -- |
| Red pine | 1,326 | 60 | 48 | -- | -- | -- | 2 | -- | -- | -- | -- | -- |
| Jack pine | 74 | 66 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 10 | -- | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 26 | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 104 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 83 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 221 | 41 | 9 | -- | 2 | 6 | 10 | -- | 3 | -- | -- | -- |
| Total | 1,969 | 196 | 63 | -- | 2 | 6 | 12 | -- | 10 | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 5,938 | 300 | 301 | 25 | 127 | 394 | 61 | 90 | 157 | 51 | 133 | 145 |
| Select red oaks | 7,311 | 420 | 411 | 146 | 155 | 156 | 536 | 295 | 236 | 118 | 114 | 234 |
| Other red oaks | 2,532 | 150 | 151 | 22 | -- | 626 | -- | 19 | -- | -- | 58 | -- |
| Hickory | 632 | 13 | 30 | 11 | 18 | 63 | 28 | 14 | 17 | 2 | 3 | 25 |
| Yellow birch | 14 | 1 | 1 | 1 | -- | 1 | 3 | -- | -- | -- | -- | -- |
| Hard maple | 3,233 | 192 | 208 | 71 | 53 | 177 | 70 | 62 | 206 | 28 | 113 | 80 |
| Soft maple | 5,879 | 237 | 277 | 89 | 150 | 491 | 113 | 85 | 174 | 103 | 161 | 148 |
| Beech | 756 | 23 | 30 | 21 | 11 | 109 | 31 | 8 | 16 | 4 | 10 | 8 |
| Ash | 2,664 | 157 | 146 | 43 | 51 | 215 | 28 | 53 | 84 | 23 | 52 | 66 |
| Balsam poplar | 9 | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 837 | 2 | 1 | 25 | 5 | 2 | 9 | 6 | 1 | 13 | 18 | 6 |
| Bigtooth aspen | 883 | 15 | 17 | 27 | -- | -- | -- | 16 | -- | 13 | 187 | 1 |
| Quaking aspen | 614 | 9 | 8 | -- | -- | 3 | 3 | -- | -- | 4 | 30 | -- |
| Basswood | 1,179 | 33 | 56 | 21 | 15 | 60 | 31 | 25 | 36 | 20 | 51 | 28 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 205 | 5 | 4 | 28 | 28 | -- | 11 | 1 | 3 | -- | -- | 32 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 626 | 15 | 18 | 40 | 23 | 28 | 40 | 2 | 27 | 24 | 1 | 22 |
| Paper birch | 110 | -- | -- | 9 | 9 | -- | -- | -- | -- | -- | -- | 9 |
| Other hardwoods[2] | 1,881 | 130 | 231 | 76 | 43 | 186 | 67 | 2 | 128 | 1 | -- | 65 |
| Total | 35,303 | 1,702 | 1,890 | 656 | 688 | 2,511 | 1,031 | 678 | 1,085 | 404 | 931 | 869 |
| All species | 37,272 | 1,898 | 1,953 | 656 | 690 | 2,517 | 1,043 | 678 | 1,095 | 404 | 931 | 869 |

(Table 54 continued on next page)

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[1] Removals in 1979 are trend-level removals.

[2] Includes black cherry.

(Table 54 continued)

| Species group | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | -- | -- | -- | -- | 2 | 7 | -- | -- | -- | -- | -- | 22 |
| Red pine | -- | -- | 11 | -- | 5 | 5 | -- | -- | 1 | -- | -- | 102 |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 |
| White spruce | -- | 1 | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3 |
| Tamarack | 6 | -- | 7 | -- | -- | 9 | 5 | -- | -- | 21 | -- | 35 |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | -- | 3 |
| Other softwoods | -- | -- | -- | 2 | 51 | 6 | -- | -- | 21 | -- | -- | -- |
| Total | 6 | 1 | 18 | 2 | 60 | 27 | 5 | -- | 22 | 34 | -- | 166 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 29 | 168 | 170 | 438 | 29 | 360 | 199 | 133 | 89 | 27 | 167 | 331 |
| Select red oaks | 45 | 256 | 395 | 161 | 35 | 393 | 136 | 142 | 124 | 14 | 116 | 596 |
| Other red oaks | -- | 17 | 66 | 223 | 73 | 602 | 3 | -- | 5 | -- | 16 | 71 |
| Hickory | -- | 49 | 13 | 62 | 5 | 11 | 13 | 35 | 14 | 2 | 20 | 11 |
| Yellow birch | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 36 | 136 | 246 | 85 | 36 | 279 | 63 | 41 | 7 | 8 | 18 | 244 |
| Soft maple | 86 | 180 | 276 | 254 | 71 | 332 | 194 | 110 | 78 | 48 | 69 | 323 |
| Beech | -- | 29 | 98 | 28 | 2 | 44 | 3 | 9 | 27 | 5 | 3 | 64 |
| Ash | 37 | 72 | 155 | 112 | 6 | 150 | 95 | 72 | 40 | 15 | 28 | 139 |
| Balsam poplar | 1 | -- | -- | -- | -- | -- | 1 | 2 | -- | -- | -- | -- |
| Cottonwood | 73 | 29 | 10 | 1 | -- | 2 | 98 | 50 | -- | 4 | 14 | 46 |
| Bigtooth aspen | 2 | 1 | 1 | 2 | 1 | 76 | 5 | 1 | -- | -- | -- | 288 |
| Quaking aspen | 39 | 8 | 2 | -- | -- | 13 | 55 | 1 | -- | -- | 1 | 130 |
| Basswood | 9 | 52 | 57 | 24 | 5 | 75 | 43 | 34 | 4 | 7 | 20 | 85 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | 5 | -- | 27 | 3 | -- | -- | 4 | -- | -- | 3 | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 2 | 30 | 9 | 16 | 9 | 16 | 12 | 13 | 7 | 13 | 10 | 35 |
| Paper birch | 10 | -- | -- | 9 | -- | 1 | 11 | 5 | -- | -- | -- | 2 |
| Other hardwoods | 2 | 42 | 132 | 117 | 25 | 100 | 26 | 44 | 12 | 4 | 24 | 50 |
| Total | 371 | 1,074 | 1,630 | 1,560 | 300 | 2,454 | 957 | 696 | 407 | 147 | 509 | 2,415 |
| All species | 377 | 1,075 | 1,648 | 1,562 | 360 | 2,481 | 962 | 696 | 429 | 181 | 509 | 2,581 |

(Table 54 continued on next page)

(Table 54 continued)

| Species group | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | 40 | -- | 5 | 3 | 5 | -- | -- | -- | 3 | 4 | -- | -- |
| Red pine | 330 | 1 | 736 | -- | -- | -- | -- | 8 | -- | 10 | 7 | -- |
| Jack pine | 5 | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 13 | -- | 4 | -- | 3 | -- | -- | -- | 1 | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 21 | -- |
| Northern white-cedar | 1 | -- | -- | -- | 5 | -- | -- | -- | 61 | -- | -- | -- |
| Other softwoods | -- | -- | 61 | 1 | 5 | 1 | -- | -- | -- | 2 | -- | -- |
| Total | 389 | 1 | 808 | 4 | 18 | 2 | -- | 8 | 65 | 16 | 28 | -- |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 235 | 115 | 231 | 180 | 509 | 101 | 69 | 122 | 44 | 104 | 254 | 50 |
| Select red oaks | 303 | 79 | 199 | 96 | 193 | 305 | 49 | 174 | 57 | 407 | 208 | 7 |
| Other red oaks | 181 | 6 | 57 | 65 | -- | 49 | -- | 2 | -- | 27 | 43 | -- |
| Hickory | 1 | 13 | 3 | 6 | 20 | 37 | -- | 13 | 1 | 11 | 66 | 2 |
| Yellow birch | -- | -- | 1 | -- | 5 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 79 | 39 | 33 | 107 | 86 | 87 | 33 | 92 | 46 | 157 | 15 | -- |
| Soft maple | 186 | 90 | 89 | 190 | 401 | 129 | 104 | 106 | 231 | 171 | 117 | 16 |
| Beech | 15 | 5 | 39 | 11 | 7 | 39 | 1 | 20 | 1 | 20 | 13 | 2 |
| Ash | 49 | 39 | 22 | 81 | 172 | 40 | 121 | 88 | 46 | 89 | 69 | 9 |
| Balsam poplar | -- | 1 | -- | -- | -- | -- | 1 | -- | 2 | -- | -- | -- |
| Cottonwood | 5 | -- | 2 | 96 | 108 | 7 | 68 | 25 | 74 | 21 | 15 | 1 |
| Bigtooth aspen | 149 | -- | 8 | 8 | 1 | 5 | -- | 1 | 55 | 3 | -- | -- |
| Quaking aspen | 49 | 9 | 7 | 50 | 28 | 1 | 22 | 1 | 137 | 2 | 1 | 1 |
| Basswood | 6 | 15 | 9 | 61 | 74 | 49 | 14 | 51 | 20 | 37 | 37 | 15 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 3 | -- | -- | -- | -- | 9 | -- | -- | -- | 34 | 5 | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 4 | 11 | 9 | 5 | 37 | 18 | 27 | 50 | 4 | 27 | 12 | 10 |
| Paper birch | 1 | -- | -- | 3 | 28 | -- | 2 | -- | 2 | 9 | -- | -- |
| Other hardwoods | 25 | 16 | 104 | 4 | 25 | 82 | 42 | 4 | 2 | 57 | 11 | 2 |
| Total | 1,291 | 438 | 813 | 963 | 1,694 | 958 | 553 | 749 | 722 | 1,176 | 866 | 115 |
| All species | 1,680 | 439 | 1,621 | 967 | 1,712 | 960 | 553 | 757 | 787 | 1,192 | 894 | 115 |

Table 55.--Timber removals[1] from sawtimber on commercial forest land by species group and county, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)[2]

| Species group | All counties | County |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Alegen | Barry | Berrien | Branch | Calhoun | Cass | Clinton | Eaton | Genesee | Gratiot | Hillsdale |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 662 | 142 | -- | -- | -- | -- | -- | -- | 21 | -- | -- | -- |
| Red pine | 3,388 | 150 | 119 | -- | -- | -- | 4 | -- | -- | -- | 2 | -- |
| Jack pine | 134 | 134 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 67 | 5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | 25 | 5 | 1 | -- | -- | 1 | -- | -- | -- | -- | -- | -- |
| Total | 4,303 | 436 | 120 | -- | -- | 1 | 4 | -- | 21 | -- | 2 | -- |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 30,242 | 1,575 | 1,557 | 134 | 638 | 2,009 | 344 | 377 | 748 | 274 | 673 | 721 |
| Select red oaks | 36,100 | 2,226 | 2,084 | 675 | 832 | 852 | 2,730 | 1,438 | 1,226 | 516 | 630 | 1,248 |
| Other red oaks | 12,953 | 581 | 838 | 116 | -- | 3,247 | -- | 96 | -- | -- | 242 | -- |
| Hickory | 3,136 | 75 | 171 | 56 | 80 | 305 | 147 | 41 | 91 | 10 | 18 | 101 |
| Yellow birch | 60 | -- | -- | 5 | -- | 5 | 15 | -- | -- | -- | -- | -- |
| Hard maple | 17,732 | 1,090 | 1,151 | 386 | 287 | 1,000 | 387 | 352 | 983 | 152 | 631 | 441 |
| Soft maple | 27,864 | 1,129 | 1,349 | 431 | 648 | 2,383 | 520 | 394 | 873 | 436 | 807 | 681 |
| Beech | 3,902 | 120 | 169 | 114 | 62 | 599 | 170 | 43 | 89 | 20 | 59 | 47 |
| Ash | 12,562 | 772 | 730 | 210 | 228 | 1,049 | 129 | 213 | 405 | 104 | 254 | 315 |
| Balsam poplar | 29 | -- | -- | 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 4,203 | 10 | 6 | 144 | 25 | 15 | 51 | 32 | 7 | 65 | 92 | 33 |
| Bigtooth aspen | 3,019 | 26 | 66 | 150 | 1 | -- | -- | 53 | -- | 43 | 521 | 6 |
| Quaking aspen | 1,852 | 25 | -- | -- | -- | 2 | 5 | -- | -- | 13 | 133 | -- |
| Basswood | 6,003 | 172 | 287 | 112 | 83 | 310 | 159 | 115 | 184 | 91 | 262 | 143 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 1,134 | 35 | 29 | 148 | 160 | 6 | 56 | 8 | 19 | -- | -- | 183 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,263 | 31 | 25 | 87 | 40 | 40 | 46 | -- | 25 | 65 | -- | 46 |
| Paper birch | 417 | 1 | -- | 47 | 47 | -- | -- | -- | -- | -- | -- | 47 |
| Other hardwoods[3] | 7,341 | 579 | 950 | 284 | 146 | 792 | 255 | 10 | 569 | -- | -- | 215 |
| Total | 169,812 | 8,447 | 9,412 | 3,102 | 3,277 | 12,614 | 5,014 | 3,172 | 5,219 | 1,789 | 4,322 | 4,227 |
| All species | 174,115 | 8,883 | 9,532 | 3,102 | 3,277 | 12,615 | 5,018 | 3,172 | 5,240 | 1,789 | 4,324 | 4,227 |

(Table 55 continued on next page)

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[1] Removals in 1979 are trend-level removals..

[2] International 1/4-inch rule.

[3] Includes black cherry.

(Table 55 continued)

| Species group | Huron | Ingham | Ionia | Jackson | Kalamazoo | Kent | Lapeer | Lenawee | Livingston | Macomb | Monroe | Montcalm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | County | | | | | | | | | | | |
| SOFTWOODS | | | | | | | | | | | | |
| White pine | -- | -- | -- | -- | 10 | 41 | -- | -- | -- | -- | -- | 118 |
| Red pine | -- | -- | 40 | -- | 14 | 29 | -- | -- | 2 | -- | -- | 266 |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8 |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5 | -- | 3 |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | -- | -- | -- | -- | 7 | 1 | -- | -- | 2 | -- | -- | -- |
| Total | -- | -- | 40 | -- | 31 | 71 | -- | -- | 4 | 5 | -- | 395 |
| HARDWOODS | | | | | | | | | | | | |
| Select white oaks | 151 | 847 | 892 | 2,236 | 154 | 1,848 | 1,047 | 659 | 458 | 131 | 816 | 1,698 |
| Select red oaks | 235 | 1,246 | 2,079 | 621 | 192 | 1,743 | 720 | 731 | 488 | 69 | 588 | 2,853 |
| Other red oaks | -- | 141 | 272 | 1,369 | 337 | 3,139 | -- | -- | 23 | -- | 95 | 417 |
| Hickory | -- | 210 | 60 | 308 | 32 | 63 | 67 | 163 | 80 | 11 | 107 | 57 |
| Yellow birch | -- | -- | -- | 3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 202 | 768 | 1,390 | 481 | 202 | 1,478 | 338 | 212 | 31 | 31 | 101 | 1,365 |
| Soft maple | 423 | 908 | 1,389 | 1,205 | 342 | 1,580 | 924 | 506 | 332 | 210 | 325 | 1,528 |
| Beech | -- | 160 | 403 | 156 | 12 | 241 | 15 | 49 | 139 | 21 | 20 | 282 |
| Ash | 166 | 332 | 790 | 551 | 16 | 736 | 445 | 349 | 160 | 62 | 139 | 670 |
| Balsam poplar | 3 | -- | -- | -- | -- | -- | 3 | 10 | -- | -- | -- | -- |
| Cottonwood | 371 | 100 | 53 | 4 | 3 | 13 | 492 | 252 | -- | 17 | 67 | 234 |
| Bigtooth aspen | -- | 3 | 4 | 10 | 5 | 148 | -- | 4 | -- | -- | -- | 1,201 |
| Quaking aspen | 118 | 13 | -- | -- | -- | 24 | 185 | 3 | -- | -- | 6 | 291 |
| Basswood | 51 | 264 | 291 | 122 | 23 | 381 | 221 | 171 | 24 | 35 | 100 | 431 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | -- | 19 | 2 | 151 | 16 | 3 | -- | 18 | -- | -- | 16 | 3 |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | 77 | 11 | 26 | 5 | 36 | 4 | 33 | 15 | 10 | 14 | 66 |
| Paper birch | 24 | -- | -- | 47 | -- | 1 | 32 | 23 | -- | -- | -- | 2 |
| Other hardwoods | 6 | 151 | 588 | 422 | 80 | 497 | 92 | 151 | 44 | 13 | 81 | 169 |
| Total | 1,750 | 5,239 | 8,224 | 7,712 | 1,419 | 11,931 | 4,585 | 3,334 | 1,794 | 610 | 2,475 | 11,267 |
| All species | 1,750 | 5,239 | 8,264 | 7,712 | 1,450 | 12,002 | 4,585 | 3,334 | 1,798 | 615 | 2,475 | 11,662 |

(Table 55 continued on next page)

(Table 55 continued)

| Species group | County |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Muskegon | Oakland | Ottawa | Saginaw | St. Clair | St. Joseph | Sanilac | Shiawassee | Tuscola | Van Buren | Washtenaw | Wayne |
| SOFTWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| White pine | 221 | -- | 28 | 19 | 25 | -- | -- | -- | 15 | 22 | -- | -- |
| Red pine | 822 | 2 | 1,837 | -- | -- | -- | -- | 20 | -- | 65 | 16 | -- |
| Jack pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 36 | -- | 10 | -- | 8 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | 19 | -- | -- | -- | -- | -- | -- | -- |
| Other softwoods | -- | -- | 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,079 | 2 | 1,883 | 19 | 52 | -- | -- | 20 | 15 | 87 | 16 | -- |
| HARDWOODS |  |  |  |  |  |  |  |  |  |  |  |  |
| Select white oaks | 1,206 | 602 | 891 | 959 | 2,633 | 532 | 358 | 647 | 234 | 560 | 1358 | 275 |
| Select red oaks | 1,362 | 382 | 772 | 554 | 994 | 1,299 | 259 | 843 | 296 | 2064 | 1222 | 31 |
| Other red oaks | 998 | 25 | 204 | 299 | -- | 291 | -- | 12 | -- | 137 | 74 | -- |
| Hickory | 7 | 71 | 11 | 36 | 53 | 194 | -- | 71 | 5 | 63 | 361 | 11 |
| Yellow birch | -- | -- | 4 | -- | 28 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 441 | 213 | 179 | 609 | 475 | 474 | 158 | 522 | 247 | 875 | 80 | -- |
| Soft maple | 849 | 427 | 385 | 933 | 1,761 | 643 | 476 | 504 | 1118 | 805 | 575 | 65 |
| Beech | 81 | 17 | 191 | 64 | 36 | 215 | 5 | 107 | 5 | 107 | 72 | 12 |
| Ash | 241 | 173 | 99 | 404 | 788 | 184 | 475 | 359 | 214 | 427 | 338 | 35 |
| Balsam poplar | -- | 2 | -- | -- | -- | -- | 3 | -- | 5 | -- | -- | -- |
| Cottonwood | 26 | -- | 7 | 467 | 538 | 40 | 347 | 122 | 374 | 115 | 75 | 6 |
| Bigtooth aspen | 491 | 1 | 20 | 38 | -- | 19 | 2 | 3 | 183 | 21 | -- | -- |
| Quaking aspen | 130 | 17 | 14 | 157 | 110 | -- | 53 | -- | 551 | 2 | -- | -- |
| Basswood | 29 | 77 | 46 | 312 | 375 | 245 | 61 | 263 | 101 | 190 | 189 | 83 |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 24 | -- | 1 | -- | -- | 30 | -- | -- | -- | 179 | 28 |  |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | -- | 18 | 26 | 4 | 113 | 37 | 84 | 158 | 5 | 53 | 41 | 22 |
| Paper birch | 1 | -- | -- | -- | 93 | -- | 2 | -- | 3 | 47 | -- | -- |
| Other hardwoods | 82 | 52 | 336 | 11 | 82 | 294 | 140 | 11 | 6 | 187 | 40 | 6 |
| Total | 5,968 | 2,077 | 3,186 | 4,847 | 8,079 | 4,497 | 2,423 | 3,622 | 3,347 | 5,832 | 4,453 | 546 |
| All species | 7,047 | 2,079 | 5,069 | 4,866 | 8,131 | 4,497 | 2,423 | 3,642 | 3,362 | 5,919 | 4,469 | 546 |

Table 56.--Timber removals[1] from growing stock and sawtimber on commercial forest land by species group, Southern Lower Peninsula, Michigan, 1965 and 1979

| Species group | Growing stock | | Sawtimber | |
|---|---|---|---|---|
| | [2]1965 | 1979 | [2]1965 | 1979 |
| | Thousand cubic feet | | [3]Thousand board feet | |
| SOFTWOODS | | | | |
| White pine | 386 | 125 | 2,050 | 662 |
| Red pine | 155 | 1,326 | 284 | 3,388 |
| Jack pine | 98 | 74 | 183 | 134 |
| White spruce | -- | 10 | 5 | -- |
| Black spruce | -- | -- | -- | -- |
| Balsam fir | -- | -- | 2 | -- |
| Hemlock | 95 | 26 | 550 | 67 |
| Tamarack | 157 | 104 | 109 | 8 |
| Northern white-cedar | 119 | 83 | 53 | 19 |
| Other softwoods | 190 | 221 | 118 | 25 |
| Total | 1,200 | 1,969 | 3,354 | 4,303 |
| HARDWOODS | | | | |
| Select white oaks | 5,359 | 5,938 | 25,506 | 30,242 |
| Select red oaks | 5,597 | 7,311 | 29,211 | 36,100 |
| Other red oaks | 2,466 | 2,532 | 9,544 | 12,953 |
| Hickory | 760 | 632 | 3,771 | 3,136 |
| Yellow birch | 75 | 14 | 148 | 60 |
| Hard maple | 3,854 | 3,233 | 19,960 | 17,732 |
| Soft maple | 6,330 | 5,879 | 28,364 | 27,864 |
| Beech | 1,311 | 756 | 6,600 | 3,902 |
| Ash | 2,732 | 2,664 | 10,307 | 12,562 |
| Balsam poplar | 67 | 9 | 239 | 29 |
| Cottonwood | 1,119 | 837 | 6,239 | 4,203 |
| Bigtooth aspen | 1,732 | 883 | 5,922 | 3,019 |
| Quaking aspen | 1,204 | 614 | 3,632 | 1,852 |
| Basswood | 1,687 | 1,179 | 9,248 | 6,003 |
| Black walnut | 382 | 205 | 2,364 | 1,134 |
| Elm | 6,983 | 626 | 37,965 | 1,263 |
| Paper birch | 179 | 110 | 117 | 417 |
| Other hardwoods[5] | 2,263 | 1,881 | 8,560 | 7,341 |
| Total | 44,100 | 35,303 | 207,697 | 169,812 |
| All species | 45,300 | 37,272 | 211,051 | 174,115 |

[1] Removals in 1979 are trend-level removals.

[2] Figures have been adjusted from those published after the 1966 survey to conform 1980 volumes because of changes in survey definitions and procedures.

[3] International 1/4-inch rule.

[4] Included in other hardwoods.

[5] Includes black cherry in 1965 and 1979 and hickory in 1965.

Table 57.--Timber removals[1] from growing stock and sawtimber on commercial forest land by item and species category, Southern Lower Peninsula, Michigan, 1979

| Item | Growing stock | | | | | | Sawtimber | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods |
| | - - - - - - - - Thousand cubic feet- - - - - - - - - | | | | | | - - - - - - - - - [2]Thousand board feet- - - - - - - - - - | | | | | |
| ROUNDWOOD PRODUCTS | | | | | | | | | | | | |
| Pulpwood | 1,967 | 1,312 | -- | 429 | 7 | 219 | 4,280 | 3,351 | -- | 736 | 16 | 177 |
| Saw logs | 22,166 | 88 | -- | 674 | 2,443 | 18,961 | 122,255 | 526 | -- | 3,294 | 14,825 | 103,610 |
| Fuelwood | 4,049 | 7 | 5 | 165 | 186 | 3,686 | 13,264 | 22 | 19 | 543 | 616 | 12,064 |
| Posts | 11 | -- | -- | -- | -- | 11 | 66 | -- | -- | -- | -- | 66 |
| Veneer logs | 480 | -- | -- | 12 | 90 | 378 | 3527 | -- | -- | 86 | 649 | 2,792 |
| Poles | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other[3] | 25 | -- | -- | -- | -- | 25 | 129 | -- | -- | -- | -- | 129 |
| Total | 28,698 | 1,407 | 5 | 1,280 | 2,726 | 23,280 | 143,521 | 3,899 | 19 | 4,659 | 16,106 | 118,838 |
| LOGGING RESIDUE | 2,888 | 54 | -- | 74 | 359 | 2,401 | 8,215 | 48 | -- | 84 | 1,020 | 7,063 |
| OTHER REMOVALS | 5,686 | 64 | 439 | 143 | 148 | 4,892 | 22,379 | 237 | 100 | 128 | 606 | 21,308 |
| TOTAL REMOVALS | 37,272 | 1,525 | 444 | 1,497 | 3,233 | 30,573 | 174,115 | 4,184 | 119 | 4,871 | 17,732 | 147,209 |

[1] Removals in 1979 are trend-level removals.
[2] International 1/4-inch rule.
[3] Includes charcoal wood, shingle bolts, cabin logs, particleboard bolts, pilings, etc.
[4] Less than 500 cubic feet.

Table 58.--Net annual growth and removals[1] of growing stock on commercial forest land by species group, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 2,766 | 125 |
| Red pine | 3,181 | 1,326 |
| Jack pine | 586 | 74 |
| White spruce | 507 | 10 |
| Black spruce | -- | -- |
| Balsam fir | 6 | -- |
| Hemlock | 104 | 26 |
| Tamarack | 39 | 104 |
| Northern white-cedar | 247 | 83 |
| Other softwoods | 1,256 | 221 |
| Total | 8,692 | 1,969 |
| HARDWOODS | | |
| Select white oaks | 6,892 | 5,938 |
| Select red oaks | 9,190 | 7,311 |
| Other red oaks | 3,823 | 2,532 |
| Hickory | 2,821 | 632 |
| Yellow birch | 186 | 14 |
| Hard maple | 3,162 | 3,233 |
| Soft maple | 18,397 | 5,879 |
| Beech | 605 | 756 |
| Ash | 11,900 | 2,664 |
| Balsam poplar | 245 | 9 |
| Cottonwood | 2,157 | 837 |
| Bigtooth aspen | 3,638 | 883 |
| Quaking aspen | 4,906 | 614 |
| Basswood | 2,892 | 1,179 |
| Black walnut | 793 | 205 |
| Elm | -3,351 | 626 |
| Paper birch | 713 | 110 |
| Other hardwoods[2] | 10,143 | 1,881 |
| Total | 79,112 | 35,303 |
| All species | 87,804 | 37,272 |

[1] Removals in 1979 are trend-level removals.

[2] Includes yellow poplar, black cherry and butternut.

Table 59.--Net annual growth and removals[1] of sawtimber on commercial forest land by species group, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)[2]

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 17,855 | 662 |
| Red pine | 7,824 | 3,388 |
| Jack pine | 3,034 | 134 |
| White spruce | 73 | -- |
| Black spruce | -- | -- |
| Balsam fir | 34 | -- |
| Hemlock | 501 | 67 |
| Tamarack | 27 | 8 |
| Northern white-cedar | 208 | 19 |
| Other softwoods | 5,058 | 25 |
| Total | 34,614 | 4,303 |
| HARDWOODS | | |
| Select white oaks | 41,911 | 30,242 |
| Select red oaks | 54,556 | 36,100 |
| Other red oaks | 18,922 | 12,953 |
| Hickory | 14,894 | 3,136 |
| Yellow birch | 610 | 60 |
| Hard maple | 13,659 | 17,732 |
| Soft maple | 56,995 | 27,864 |
| Beech | 2,231 | 3,902 |
| Ash | 27,301 | 12,562 |
| Balsam poplar | 1,808 | 29 |
| Cottonwood | 8,481 | 4,203 |
| Bigtooth aspen | 10,950 | 3,019 |
| Quaking aspen | 8,283 | 1,852 |
| Basswood | 7,500 | 6,003 |
| Black walnut | 2,089 | 1,134 |
| Elm | -1,995 | 1,263 |
| Paper birch | 524 | 417 |
| Other hardwoods[3] | 28,922 | 7,341 |
| Total | 297,641 | 169,812 |
| All species | 332,255 | 174,115 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes black cherry.

Table 60.--Net annual growth and removals[1] of growing stock on commercial forest land by ownership class and softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| Ownership class | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 310 | 117 | 193 | 164 | 39 | 125 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 110 | -- | 110 | 3 | -- | 3 |
| Indian | -- | -- | -- | -- | -- | -- |
| State | 7,654 | 1,807 | 5,847 | 197 | 49 | 148 |
| County and municipal | 1,847 | 725 | 1,122 | 57 | 27 | 30 |
| Forest industry | -- | -- | -- | -- | -- | -- |
| Farmer and other | 77,883 | 6,043 | 71,840 | 36,851 | 1,854 | 34,997 |
| All owners | 87,804 | 8,692 | 79,112 | 37,272 | 1,969 | 35,303 |

[1] Removals in 1979 are trend-level removals.

[2] Includes miscellaneous private-corporation and miscellaneous private-individual.

Table 61.--Net annual growth and removals[1] of sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)[2]

| | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| Ownership class | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 1,168 | 282 | 886 | 433 | 94 | 339 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 810 | -- | 810 | 10 | -- | 10 |
| Indian | -- | -- | -- | -- | -- | -- |
| State | 31,026 | 5,504 | 25,522 | 722 | 85 | 637 |
| County and municipal | 7,683 | 3,031 | 4,652 | 112 | 10 | 102 |
| Forest industry | -- | -- | -- | -- | -- | -- |
| Farmer and other | 291,568 | 25,797 | 265,771 | 172,838 | 4,114 | 168,724 |
| All owners | 332,255 | 34,614 | 297,641 | 174,115 | 4,303 | 169,812 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes miscellaneous private-corporation and miscellaneous private-individual.

Table 62.--Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1965[1] and 1979

(In million cubic feet)

| Species | 1965[1] | 1979 |
|---|---|---|
| Softwoods | 0.2 | 0.3 |
| Hardwoods | 14.3 | 17.2 |
| Total | 14.5 | 17.5 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1979 volumes because of changes in survey definitions and procedures

Table 63.--Annual mortality of growing stock on commercial forest land by species group and cause, Southern Lower Peninsula, Michigan, 1979

(In thousand cubic feet)

| | | Cause | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Species group | All causes | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS | | | | | | | | |
| White pine | 127 | -- | 45 | -- | -- | 82 | -- | -- |
| Red pine | 4 | -- | -- | -- | -- | -- | -- | 4 |
| Jack pine | 39 | -- | 2 | -- | -- | -- | -- | 37 |
| White spruce | 7 | -- | -- | -- | -- | -- | -- | 7 |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 2 | -- | -- | -- | -- | -- | -- | 2 |
| Hemlock | 5 | -- | -- | -- | -- | -- | -- | 5 |
| Tamarack | 69 | -- | -- | -- | -- | -- | -- | 69 |
| Northern white-cedar | 19 | -- | -- | -- | -- | -- | -- | 19 |
| Other softwoods | 54 | -- | -- | -- | -- | -- | -- | 54 |
| Total | 326 | -- | 47 | -- | -- | 82 | -- | 197 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 385 | 35 | 95 | -- | -- | -- | -- | 255 |
| Select red oaks | 1,487 | -- | -- | -- | -- | 41 | -- | 1,446 |
| Other red oaks | 519 | -- | 245 | -- | -- | -- | -- | 274 |
| Hickory | 144 | -- | -- | -- | -- | 39 | -- | 105 |
| Yellow birch | 26 | -- | -- | -- | -- | -- | -- | 26 |
| Hard maple | 427 | -- | -- | -- | -- | 427 | -- | -- |
| Soft maple | 674 | -- | -- | -- | -- | 291 | -- | 383 |
| Beech | 525 | -- | -- | -- | -- | 525 | -- | -- |
| Ash | 1,251 | -- | 82 | -- | -- | 302 | -- | 867 |
| Balsam poplar | 163 | -- | 71 | -- | -- | -- | -- | 92 |
| Cottonwood | 132 | -- | 30 | -- | -- | -- | 26 | 76 |
| Bigtooth aspen | 887 | -- | 622 | -- | -- | -- | -- | 265 |
| Quaking aspen | 1,436 | -- | 466 | -- | -- | 83 | -- | 887 |
| Basswood | 273 | -- | 163 | -- | -- | -- | -- | 110 |
| Yellow-poplar | 46 | -- | -- | -- | -- | -- | -- | 46 |
| Black walnut | 100 | -- | -- | -- | -- | -- | -- | 100 |
| Black cherry | 136 | -- | -- | -- | -- | 30 | -- | 106 |
| Butternut | 9 | -- | -- | -- | -- | -- | -- | 9 |
| Elm | 8,011 | -- | 4,856 | -- | -- | -- | -- | 3,155 |
| Paper birch | 22 | -- | -- | -- | -- | -- | -- | 22 |
| Other hardwoods | 525 | -- | 119 | -- | -- | 287 | -- | 119 |
| Total | 17,178 | 35 | 6,749 | -- | -- | 2,025 | 26 | 8,343 |
| All species | 17,504 | 35 | 6,796 | -- | -- | 2,107 | 26 | 8,540 |

Table 64.--Annual mortality of sawtimber on commercial forest land by species group and cause, Southern Lower Peninsula, Michigan, 1979

(In thousand board feet)[1]

| Species group | All causes | Cause | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS | | | | | | | | |
| White pine | 353 | -- | 136 | -- | -- | 217 | -- | -- |
| Red pine | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 68 | -- | -- | -- | -- | -- | -- | 68 |
| White spruce | 4 | -- | -- | -- | -- | -- | -- | 4 |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 7 | -- | -- | -- | -- | -- | -- | 7 |
| Hemlock | 15 | -- | -- | -- | -- | -- | -- | 15 |
| Tamarack | 141 | -- | -- | -- | -- | -- | -- | 141 |
| Northern white-cedar | 6 | -- | -- | -- | -- | -- | -- | 6 |
| Other softwoods | 95 | -- | -- | -- | -- | -- | -- | 95 |
| Total | 689 | -- | 136 | -- | -- | 217 | -- | 336 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 667 | -- | 655 | -- | -- | -- | -- | 12 |
| Select red oaks | 5,464 | -- | -- | -- | -- | 187 | -- | 5,277 |
| Other red oaks | 1,226 | -- | 1,146 | -- | -- | -- | -- | 80 |
| Hickory | 228 | -- | -- | -- | -- | 11 | -- | 217 |
| Yellow birch | 52 | -- | -- | -- | -- | -- | -- | 52 |
| Hard maple | 1,382 | -- | -- | -- | -- | 1,382 | -- | -- |
| Soft maple | 1,606 | -- | -- | -- | -- | 505 | -- | 1,101 |
| Beech | 1,954 | -- | -- | -- | -- | 1,954 | -- | -- |
| Ash | 3,120 | -- | -- | -- | -- | 3,081 | -- | 39 |
| Balsam poplar | 454 | -- | -- | -- | -- | -- | -- | 454 |
| Cottonwood | 263 | -- | 11 | -- | -- | -- | -- | 252 |
| Bigtooth aspen | 1,543 | -- | -- | -- | -- | -- | -- | 1,543 |
| Quaking aspen | 1,433 | -- | 557 | -- | -- | -- | -- | 876 |
| Basswood | 908 | -- | 885 | -- | -- | -- | -- | 23 |
| Yellow-poplar | 187 | -- | -- | -- | -- | -- | -- | 187 |
| Black walnut | 305 | -- | -- | -- | -- | -- | -- | 305 |
| Black cherry | 69 | -- | -- | -- | -- | 9 | -- | 60 |
| Butternut | 23 | -- | -- | -- | -- | -- | -- | 23 |
| Elm | 9,463 | -- | 1,424 | -- | -- | -- | -- | 8,039 |
| Paper birch | 9 | -- | -- | -- | -- | -- | -- | 9 |
| Other hardwoods | 752 | -- | 261 | -- | -- | 491 | -- | -- |
| Total | 31,108 | -- | 4,939 | -- | -- | 7,620 | -- | 18,549 |
| All species | 31,797 | -- | 5,075 | -- | -- | 7,837 | -- | 18,885 |

[1] International 1/4-inch rule.

Table 65.--Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1979

| Ownership class | Growing stock |  |  | Sawtimber |  |  |
|---|---|---|---|---|---|---|
|  | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
|  | - - - Thousand cubic feet- - - |  |  | - - - [1]Thousand board feet- - - - |  |  |
| National Forest | 53 | 1 | 52 | 90 | -- | 90 |
| Bureau of Land Management | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | -- | -- | -- | -- | -- | -- |
| Indian | -- | -- | -- | -- | -- | -- |
| State | 835 | 24 | 811 | 1,469 | 46 | 1,423 |
| County and municipal | 175 | 1 | 174 | 133 | -- | 133 |
| Forest industry | -- | -- | -- | -- | -- | -- |
| Farmer | 9,028 | 82 | 8,946 | 14,141 | 251 | 13,890 |
| Misc. private-corp. | 829 | 14 | 815 | 2,172 | 5 | 2,167 |
| Misc. private-indiv. | 6,584 | 204 | 6,380 | 13,792 | 387 | 13,405 |
| All owners | 17,504 | 326 | 17,178 | 31,797 | 689 | 31,108 |

[1] International 1/4-inch rule.

Table 66.--Output of timber products by source of material and softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1978

| Product | Standard units | Total | | Roundwood products | | | | Plant byproducts | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Growing stock | | Nongrowing stock | | | |
| | | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet |
| PULPWOOD | | | | | | | | | |
| Softwood | [1] Standard cords | 19,763 | 1,560 | 16,621 | 1,312 | 3,117 | 246 | 25 | 2 |
| Hardwood | | 44,299 | 3,485 | 8,456 | 655 | 1,175 | 91 | 34,668 | 2,739 |
| Total | | 64,062 | 5,045 | 25,077 | 1,967 | 4,292 | 337 | 34,693 | 2,741 |
| SAW LOGS | | | | | | | | | |
| Softwood | [2] Thousand board feet | 547 | 89 | 541 | 88 | 6 | 1 | -- | -- |
| Hardwood | | 133,009 | 23,034 | 127,489 | 22,078 | 5,520 | 956 | -- | -- |
| Total | | 133,556 | 23,123 | 128,030 | 22,166 | 5,526 | 957 | -- | -- |
| VENEER LOGS | | | | | | | | | |
| Softwood | [2] Thousand board feet | -- | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | | 3,527 | 480 | 3,527 | 480 | -- | -- | -- | -- |
| Total | | 3,527 | 480 | 3,527 | 480 | -- | -- | -- | -- |
| FUELWOOD | | | | | | | | | |
| Softwood | [1] Standard cords | 939 | 64 | 180 | 12 | 479 | 32 | 280 | 20 |
| Hardwood | | 251,963 | 17,618 | 57,748 | 4,037 | 155,565 | 10,875 | 38,650 | 2,706 |
| Total | | 252,902 | 17,682 | 57,928 | 4,049 | 156,044 | 10,907 | 38,930 | 2,726 |
| POSTS | | | | | | | | | |
| Softwood | Thousand pieces | -- | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | | 7 | 11 | 7 | 11 | -- | -- | -- | -- |
| Total | | 7 | 11 | 7 | 11 | -- | -- | -- | -- |
| POLES | | | | | | | | | |
| Softwood | Pieces | -- | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | | -- | -- | -- | -- | -- | -- | -- | -- |
| OTHER [3] | | | | | | | | | |
| Softwood | Thousand cubic feet | 12 | 12 | -- | -- | -- | -- | 12 | 12 |
| Hardwood | | 5,085 | 5,085 | 25 | 25 | -- | -- | 5,060 | 5,060 |
| Total | | 5,097 | 5,097 | 25 | 25 | -- | -- | 5,072 | 5,072 |
| ALL PRODUCTS | | | | | | | | | |
| Softwood | Thousand cubic feet | -- | 1,725 | -- | 1,412 | -- | 279 | -- | 34 |
| Hardwood | | -- | 49,713 | -- | 27,286 | -- | 11,922 | -- | 10,505 |
| Total | | -- | 51,438 | -- | 28,698 | -- | 12,201 | -- | 10,539 |

[1] Rough-wood, 128 cubic foot basis.

[2] International 1/4-inch rule.

[3] Other (industrial production) includes cabin logs, charcoal wood, particleboard bolts, shingle bolts, pilings, etc.

Table 67.--Output of roundwood products by source and softwoods and hardwoods, Southern Lower Peninsula, Michigan, 1978

(In thousand cubic feet)

| Product and species group | All sources | Growing-stock trees |  |  | Rough and rotten trees | Salvable dead trees | Other sources |
|---|---|---|---|---|---|---|---|
|  |  | Total | Sawtimber | Poletimber |  |  |  |
| INDUSTRIAL PRODUCTS |  |  |  |  |  |  |  |
| Saw logs |  |  |  |  |  |  |  |
| Softwood | 89 | 88 | 88 | -- | -- | -- | 1 |
| Hardwood | 23,034 | 22,078 | 21,201 | 877 | 284 | 186 | 486 |
| Subtotal | 23,123 | 22,166 | 21,289 | 877 | 284 | 186 | 487 |
| Veneer logs and bolts |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 480 | 480 | 480 | -- | -- | -- | -- |
| Subtotal | 480 | 480 | 480 | -- | -- | -- | -- |
| Pulpwood |  |  |  |  |  |  |  |
| Softwood | 1,558 | 1,312 | 806 | 506 | 77 | 44 | 125 |
| Hardwood | 746 | 655 | 235 | 420 | 23 | 10 | 58 |
| Subtotal | 2,304 | 1,967 | 1,041 | 926 | 100 | 54 | 183 |
| Cooperage |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Piling |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Poles |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Mine timbers (Round) |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Posts (Round and split) |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 11 | 11 | 11 | -- | -- | -- | -- |
| Subtotal | 11 | 11 | 11 | -- | -- | -- | -- |
| Other |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 25 | 25 | 17 | 8 | -- | -- | -- |
| Subtotal | 25 | 25 | 17 | 8 | -- | -- | -- |
| All industrial products |  |  |  |  |  |  |  |
| Softwood | 1,647 | 1,400 | 894 | 506 | 77 | 44 | 126 |
| Hardwood | 24,296 | 23,249 | 21,944 | 1,305 | 307 | 196 | 544 |
| Total | 25,943 | 24,649 | 22,838 | 1,811 | 384 | 240 | 670 |
| FUELWOOD |  |  |  |  |  |  |  |
| Softwood | 44 | 12 | 7 | 5 | 2 | -- | 30 |
| Hardwood | 14,912 | 4,037 | 2,347 | 1,690 | 851 | -- | 10,024 |
| Total | 14,956 | 4,049 | 2,354 | 1,695 | 853 | -- | 10,054 |
| ALL PRODUCTS |  |  |  |  |  |  |  |
| Softwood | 1,691 | 1,412 | 901 | 511 | 79 | 44 | 156 |
| Hardwood | 39,208 | 27,286 | 24,291 | 2,995 | 1,158 | 196 | 10,568 |

Table 68.--Timber products from roundwood by species group and product, Southern Lower Peninsula, Michigan, 1978

| Species group | All Products | Pulpwood | | Saw logs | | Veneer logs | |
|---|---|---|---|---|---|---|---|
| | 1/Thousand cubic feet | Cords | 1/Thousand cubic feet | 2/Thousand board feet | 1/Thousand cubic feet | 2/Thousand board feet | 1/Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 94 | -- | -- | 428 | 70 | -- | -- |
| Red pine | 1,509 | 18,881 | 1,490 | 119 | 19 | -- | -- |
| Jack pine | 68 | 857 | 68 | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 20 | -- | -- | -- | -- | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,691 | 19,738 | 1,558 | 547 | 89 | -- | -- |
| HARDWOODS | | | | | | | |
| Select white oaks | 5,701 | 602 | 44 | 20,889 | 3,663 | 615 | 84 |
| Select red oaks | 8,615 | 1,626 | 128 | 33,513 | 5,883 | 1,187 | 163 |
| Other red oaks | 2,983 | 563 | 44 | 11,607 | 2,038 | 411 | 56 |
| Hickory | 697 | -- | -- | 1,342 | 217 | 43 | 4 |
| Yellow birch | 4 | -- | -- | 28 | 4 | -- | -- |
| Hard maple | 3,321 | 141 | 9 | 15,577 | 2,528 | 649 | 90 |
| Soft maple | 5,444 | 436 | 32 | 20,590 | 3,614 | 143 | 19 |
| Beech | 878 | 40 | 2 | 3,000 | 493 | -- | -- |
| Ash | 2,651 | 137 | 8 | 9,583 | 1,673 | 7 | -- |
| Balsam poplar | 2 | -- | -- | 10 | 2 | -- | -- |
| Cottonwood | 789 | -- | -- | 3,702 | 641 | 114 | 15 |
| Bigtooth aspen | 1,049 | 3,546 | 280 | 2,312 | 403 | 51 | 7 |
| Quaking aspen | 729 | 2,466 | 194 | 1,608 | 280 | 35 | 5 |
| Basswood | 821 | -- | -- | 4,731 | 816 | 26 | 5 |
| Black walnut | 236 | -- | -- | 855 | 139 | 173 | 22 |
| Elm | 857 | -- | -- | 73 | 12 | -- | -- |
| Paper birch | 210 | 40 | 2 | 252 | 44 | -- | -- |
| Other hardwoods3/ | 4,221 | 34 | 3 | 3,337 | 584 | 73 | 10 |
| Total | 39,208 | 9,631 | 746 | 133,009 | 23,034 | 3,527 | 480 |
| All species | 40,899 | 29,369 | 2,304 | 133,556 | 23,123 | 3,527 | 480 |

(Table 68 continued on next page)

1/Small quantities may round off to less than 500 cubic feet and will be shown as a dash in columns showing thousand cubic feet.

2/International 1/4-inch rule.

3/Includes black cherry.

(Table 68 continued)

| Species group | Fuelwood | | Posts | | Poles | | Other Products |
|---|---|---|---|---|---|---|---|
| | Cords | 1/Thousand cubic feet | Thousand pieces | 1/Thousand cubic feet | Pieces | 1/Thousand cubic feet | 1/Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 346 | 24 | -- | -- | -- | -- | -- |
| Red pine | 14 | -- | -- | -- | -- | -- | -- |
| Jack pine | -- | -- | -- | -- | -- | -- | -- |
| White spruce | -- | -- | -- | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | |
| Tamarack | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 299 | 20 | -- | -- | -- | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 659 | 44 | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | |
| Select white oaks | 27,292 | 1,908 | -- | -- | -- | -- | 2 |
| Select red oaks | 34,688 | 2,426 | -- | -- | -- | -- | 15 |
| Other red oaks | 12,014 | 840 | -- | -- | -- | -- | 5 |
| Hickory | 6,858 | 476 | -- | -- | -- | -- | -- |
| Yellow birch | -- | -- | -- | -- | -- | -- | -- |
| Hard Maple | 9,948 | 694 | -- | -- | -- | -- | -- |
| Soft maple | 25,410 | 1,777 | -- | -- | -- | -- | 2 |
| Beech | 5,438 | 382 | -- | -- | -- | -- | 1 |
| Ash | 13,823 | 970 | -- | -- | -- | -- | -- |
| Balsam poplar | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 1,903 | 133 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 5,155 | 359 | -- | -- | -- | -- | -- |
| Quaking aspen | 3,584 | 250 | -- | -- | -- | -- | -- |
| Basswood | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 1,074 | 75 | -- | -- | -- | -- | -- |
| Elm | 12,067 | 845 | -- | -- | -- | -- | -- |
| Paper birch | 2,343 | 164 | -- | -- | -- | -- | -- |
| Other hardwoods | 51,716 | 3,613 | 7 | 11 | -- | -- | -- |
| Total | 213,313 | 14,912 | 7 | 11 | -- | -- | 25 |
| All species | 213,972 | 14,956 | 7 | 11 | -- | -- | 25 |

Table 69.--Volume of primary plant residue by use and type, Southern Lower Peninsula, Michigan, 1978

(In thousand cubic feet)

| | Wood residue | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Coarse[1] | | Fine[2] | | Bark[3] | |
| Type of use | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood |
| Fiber products[4] | 2.0 | 3977.0 | 2.0 | 3977.0 | -- | -- | -- | 202.3 |
| Charcoal | -- | -- | -- | -- | -- | -- | -- | -- |
| Industrial fuel | -- | 522.8 | -- | 123.5 | -- | 399.3 | -- | 168.2 |
| Domestic fuel | 19.6 | 2,182.7 | 19.6 | 2,181.9 | -- | 0.8 | 12.6 | 1,258.7 |
| Miscellaneous[5] | 12.3 | 3,821.7 | -- | 385.4 | 12.3 | 3,436.3 | 1.3 | 2,537.3 |
| Not used[6] | 0.2 | 289.3 | -- | 131.7 | 0.2 | 157.6 | 0.2 | 198.2 |
| Total | 34.1 | 10,793.5 | 21.6 | 6,799.5 | 12.5 | 3,994.0 | 14.1 | 4,364.7 |

[1] Suitable for chipping such as slabs, edgings, veneer cores, etc.
[2] Not suitable for chipping such as sawdust, veneer clippings, etc.
[3] Does not include bark disposal at pulpmills.
[4] For manufacture of pulp, hardboard, or roofing felt.
[5] Livestock bedding, mulch, small dimension, and specialty items.
[6] Includes residue burned as waste.

Table 70.--All live shrub[1] biomass yields on commercial forest land by shrub species group and forest type, Southern Lower Peninsula, Michigan, 1980

(In pounds per acre)

| Shrub species group | Forest type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| TALL SHRUBS | | | | | | | | | | | | | | | |
| Balsam fir | -- | -- | -- | -- | -- | -- | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- |
| White pine | 50.0 | 1.2 | 958.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | 0.8 | -- | -- | 10.0 | -- | -- | -- | -- | -- |
| Boxelder | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.4 | -- | -- | -- | 3.6 | -- |
| Red maple | -- | -- | 11.2 | -- | -- | -- | 521.6 | -- | 81.6 | 18.4 | 35.2 | 74.8 | -- | -- | -- |
| Silver maple | -- | -- | -- | -- | -- | -- | -- | -- | 5.6 | 31.6 | -- | -- | -- | -- | -- |
| Sugar maple | -- | 166.4 | -- | -- | -- | -- | -- | -- | 21.2 | 0.4 | 89.6 | -- | -- | -- | -- |
| Speckled alder | -- | -- | -- | -- | -- | -- | -- | -- | -- | 802.0 | 58.4 | 93.6 | -- | -- | -- |
| Paper birch | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.2 | -- | -- | -- |
| American hornbeam | -- | -- | -- | -- | -- | -- | -- | -- | 14.8 | .4 | 48.4 | -- | -- | -- | -- |
| Dogwood | -- | -- | 38.0 | -- | -- | -- | 324.4 | -- | 126.4 | 394.4 | 216.8 | 220.4 | -- | -- | 2.0 |
| Flowering dogwood | -- | -- | -- | -- | -- | -- | -- | -- | 17.6 | -- | 13.6 | -- | -- | -- | -- |
| Hawthorn | -- | -- | -- | -- | -- | -- | -- | -- | 17.2 | 10.4 | 21.6 | 2.4 | -- | -- | 10.0 |
| Beech | -- | 0.4 | -- | -- | -- | -- | -- | -- | -- | -- | 6.0 | 0.4 | -- | -- | -- |
| White ash | -- | 2.0 | -- | -- | 69.2 | -- | -- | -- | 76.0 | 37.2 | 62.4 | 92.0 | -- | -- | 7.2 |
| Black ash | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15.6 | 0.4 | 4.8 | -- | -- | -- |
| Green ash | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 | 14.4 | 0.8 | -- | -- | -- | -- |
| Spice bush | -- | -- | -- | -- | -- | -- | -- | -- | 0.4 | 86.4 | 53.2 | -- | -- | -- | -- |
| Apple | -- | -- | -- | -- | -- | -- | -- | -- | 12.4 | -- | 17.6 | -- | -- | -- | -- |
| Eastern hophorn | -- | -- | -- | -- | -- | -- | -- | -- | 8.4 | -- | 4.8 | -- | -- | -- | -- |
| Bigtooth aspen | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.6 | 51.2 | -- | -- | -- |
| Quaking aspen | -- | -- | -- | -- | -- | -- | -- | -- | 12.8 | 24.4 | 8.0 | 92.8 | -- | 2.0 | -- |
| Pincherry | -- | -- | -- | -- | -- | -- | -- | -- | 9.6 | -- | -- | -- | -- | -- | -- |
| Black cherry | 8.8 | 251.6 | 462.4 | -- | -- | -- | -- | -- | 236.4 | 45.6 | 175.2 | 187.2 | -- | 250.0 | -- |
| Chokecherry | -- | 8.0 | -- | -- | -- | -- | -- | -- | 9.2 | 1.6 | 9.2 | 2.0 | -- | -- | -- |
| Pawpaw | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.6 | 8.4 | -- | -- | -- | -- |
| White oak | -- | -- | 1.6 | -- | -- | -- | -- | -- | 63.2 | 2.0 | 3.6 | 2.0 | -- | -- | -- |
| Northern red oak | 16.8 | 482.0 | 5.2 | -- | -- | -- | -- | -- | 96.4 | 0.4 | 12.0 | 42.8 | -- | -- | -- |
| Black oak | -- | -- | -- | -- | -- | -- | -- | -- | 24.8 | -- | 1.2 | -- | -- | -- | -- |
| Witch hazel | -- | -- | -- | -- | -- | -- | -- | -- | 33.6 | 17.6 | 24.8 | 0.8 | -- | -- | -- |
| Juneberry | 3.6 | -- | 86.4 | -- | -- | -- | -- | -- | 17.6 | -- | 12.4 | 44.0 | -- | -- | -- |
| Hazel | -- | -- | -- | -- | -- | -- | -- | -- | 0.4 | 68.4 | 12.0 | 102.4 | -- | -- | -- |
| Prickly ash | -- | -- | -- | -- | -- | -- | -- | -- | 266.8 | 46.8 | 21.2 | 3.2 | -- | -- | -- |
| Viburnum | -- | -- | 4.4 | -- | -- | -- | -- | -- | 675.2 | 382.8 | 213.2 | 2,322.0 | -- | -- | -- |
| Elder | -- | -- | -- | -- | -- | -- | -- | -- | 6.0 | 60.4 | 8.8 | 4.4 | -- | -- | -- |
| Sumac | -- | 215.6 | -- | -- | -- | -- | -- | -- | 28.4 | 32.0 | 17.2 | 329.2 | -- | -- | -- |
| Willow | -- | -- | -- | -- | -- | -- | -- | -- | 0.8 | 154.0 | 17.2 | 108.8 | -- | 183.2 | 29.2 |
| Sassafras | -- | -- | -- | -- | -- | -- | -- | -- | 91.6 | 0.8 | 72.8 | -- | -- | -- | -- |
| American basswood | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 | 0.8 | 15.2 | -- | -- | -- | -- |
| American elm | -- | -- | -- | -- | -- | -- | 7.6 | -- | 12.4 | 179.6 | 60.0 | 0.8 | -- | -- | -- |
| Slippery elm | -- | -- | -- | -- | -- | -- | -- | -- | 25.2 | 8.0 | 10.0 | -- | -- | -- | -- |
| Rock elm | -- | -- | -- | -- | -- | -- | -- | -- | 24.4 | 50.8 | 1.2 | -- | -- | -- | -- |
| Total | 79.2 | 1,127.2 | 1,567.6 | -- | 69.2 | -- | 859.2 | -- | 2,022.4 | 2,507.2 | 1,336.0 | 3,787.2 | -- | 438.8 | 48.4 |

(Table 70 continued on next page)

(Table 70 continued)

| Shrub species group | Forest type | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| LOW SHRUBS | | | | | | | | | | | | | | | |
| Spirea | -- | -- | -- | -- | -- | -- | -- | -- | -- | 29.5 | 3.7 | 15.3 | -- | -- | -- |
| Gooseberry-currant | -- | -- | -- | -- | -- | -- | -- | -- | 5.2 | 1.3 | 1.5 | 4.1 | -- | -- | -- |
| Raspberry-black | -- | 20.8 | -- | -- | -- | -- | 3.3 | -- | 57.5 | 5.9 | 36.4 | 25.7 | -- | 573.5 | -- |
| Rose | -- | -- | -- | -- | -- | -- | -- | -- | 5.6 | 2.1 | 6.6 | -- | -- | -- | -- |
| Willow herb | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12.7 | -- | -- | -- | -- | 12.7 |
| Black huckleberry | -- | -- | -- | -- | -- | -- | -- | -- | 8.1 | -- | -- | -- | -- | -- | -- |
| Bilberry-bluebery | -- | -- | 20.3 | -- | -- | -- | -- | -- | 39.4 | -- | 1.0 | 1.7 | -- | -- | -- |
| Bush honeysuckle | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 42.7 | -- | -- | -- |
| Greenbriar | -- | -- | -- | -- | -- | -- | -- | -- | 17.5 | -- | -- | -- | -- | -- | -- |
| Grape | -- | -- | -- | -- | -- | -- | 3.3 | -- | -- | 3.8 | 1.9 | -- | -- | -- | -- |
| Total | -- | 20.8 | 20.3 | -- | -- | -- | 6.6 | -- | 133.3 | 55.3 | 51.1 | 89.5 | -- | 573.5 | 12.7 |
| All shrubs | 79.2 | 1,148.0 | 1,587.9 | -- | 69.2 | -- | 865.8 | -- | 2,155.7 | 2,562.5 | 1,387.1 | 3,876.7 | -- | 1,012.3 | 61.1 |
| Number of plots[2] | 1 | 3 | 2 | -- | 1 | -- | 2 | -- | 103 | 69 | 136 | 14 | -- | 3 | 2 |

[1] Trees under 1.0-inch d.b.h. are also included. Tree and shrub species that averaged less than 1.0 pound per acre are not included.

[2] Number of plots by forest type from which average yields were derived.

## Table 71.--All live tree biomass yields on commercial forest land by species group and forest type, Southern Lower Peninsula, Michigan, 1980

(In pounds per acre)

| | Forest type | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shrub species group | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 718 | 5,166 | 83,606 | -- | -- | -- | 931 | -- | 1,596 | 485 | 1,550 | 1,424 | -- | 4,155 | -- |
| Red pine | 14 | 90,920 | 13,830 | -- | -- | -- | -- | -- | 490 | 80 | 207 | 1,145 | -- | 5,306 | -- |
| Jack pine | 68,023 | 8,386 | -- | -- | -- | -- | -- | -- | 336 | -- | 1 | -- | -- | 1,073 | -- |
| White spruce | -- | -- | -- | -- | 20,921 | -- | -- | -- | 145 | -- | 33 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | 446 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- |
| Hemlock | -- | -- | -- | -- | -- | -- | -- | -- | 85 | 128 | 584 | -- | -- | -- | -- |
| Tamarack | -- | -- | -- | -- | -- | -- | 8,438 | 43,131 | -- | 253 | 70 | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | -- | -- | -- | -- | 12,880 | -- | -- | 155 | 145 | 4 | 4,372 | -- | -- |
| Other softwoods | -- | 1,744 | 8,683 | -- | 27,013 | -- | -- | -- | 238 | 72 | 1,153 | -- | -- | 64,886 | -- |
| Total | 68,755 | 106,662 | 106,119 | -- | 47,934 | -- | 22,249 | 43,131 | 2,890 | 1,174 | 3,743 | 2,573 | 4,372 | 75,420 | -- |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 121 | 2,837 | 2,446 | -- | -- | -- | -- | -- | 40,702 | 4,378 | 6,643 | 2,998 | -- | 461 | -- |
| Select red oaks | 21,969 | 1,726 | 15,188 | -- | -- | -- | -- | -- | 39,922 | 1,690 | 8,887 | 4,792 | -- | 2,533 | -- |
| Other red oaks | 501 | 48 | -- | -- | -- | -- | -- | -- | 16,515 | 644 | 1,325 | 604 | -- | 1,951 | -- |
| Hickory | 2,596 | -- | -- | -- | -- | -- | -- | -- | 11,643 | 688 | 4,885 | 291 | -- | -- | -- |
| Yellow birch | -- | -- | -- | -- | -- | -- | -- | -- | 75 | 551 | 916 | -- | -- | -- | -- |
| Hard maple | 1,154 | -- | -- | -- | -- | -- | 2,565 | -- | 1,272 | 489 | 13,270 | -- | -- | -- | -- |
| Soft maple | 6,743 | 172 | 1,152 | -- | -- | -- | 9 | -- | 7,357 | 36,784 | 15,227 | 5,137 | 4,222 | -- | -- |
| Beech | -- | 1 | -- | -- | -- | -- | -- | -- | 312 | 382 | 5,090 | 261 | -- | -- | -- |
| Ash | -- | -- | -- | -- | 308 | -- | 504 | -- | 3,717 | 16,625 | 15,365 | 3,843 | 2,405 | -- | 512 |
| Balsam poplar | -- | -- | -- | -- | -- | -- | -- | -- | 38 | 476 | 183 | 1,829 | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | 808 | 4,683 | 1,878 | 3,698 | -- | -- | -- |
| Bigtooth aspen | -- | 372 | -- | -- | -- | -- | -- | -- | 3,050 | 276 | 1,762 | 15,893 | -- | -- | -- |
| Quaking aspen | 1 | 141 | -- | -- | -- | -- | 2,233 | -- | 1,478 | 2,825 | 1,402 | 21,377 | 4,223 | 9,863 | -- |
| Basswood | -- | -- | -- | -- | -- | -- | -- | -- | 983 | 1,974 | 5,957 | 641 | 21,681 | -- | -- |
| Yellow-poplar | -- | 737 | -- | -- | -- | -- | -- | -- | 263 | 240 | 1,182 | -- | -- | -- | -- |
| Black walnut | -- | -- | -- | -- | -- | -- | -- | -- | 2,956 | 562 | 617 | -- | -- | -- | -- |
| Black cherry | -- | 1,041 | 5,522 | -- | 13,425 | -- | -- | -- | 6,139 | 2,676 | 6,749 | 3,117 | -- | 3,014 | 132 |
| Butternut | 2,617 | -- | -- | -- | -- | -- | 2,242 | -- | 314 | 258 | 158 | -- | -- | -- | -- |
| Elm | -- | -- | -- | -- | -- | -- | 215 | -- | 1,476 | 8,634 | 4,895 | 2,320 | 2,624 | -- | 1,512 |
| Paper birch | -- | -- | -- | -- | -- | -- | 947 | -- | 314 | 688 | 736 | 4,784 | 18,509 | -- | -- |
| Other hardwoods | 1,271 | 802 | -- | -- | 2,714 | -- | -- | -- | 2,447 | 6,887 | 6,053 | 1,197 | 686 | 2,545 | -- |
| Noncommercial species | 1 | 54 | -- | -- | -- | -- | -- | -- | 1,957 | 2,399 | 3,590 | 1,546 | -- | -- | 1,908 |
| Total | 36,974 | 7,931 | 24,308 | -- | 16,447 | -- | 8,715 | -- | 143,738 | 94,809 | 106,770 | 74,328 | 54,350 | 20,367 | 4,064 |
| All species | 105,729 | 114,593 | 130,427 | -- | 64,381 | -- | 30,964 | 43,131 | 146,628 | 95,983 | 110,513 | 76,901 | 58,722 | 95,787 | 4,064 |
| Number of plots[1] | 3 | 9 | 6 | -- | 2 | -- | 5 | 1 | 170 | 148 | 240 | 42 | 2 | 8 | 13 |

[1] Number of plots by forest type from which average yields were derived.

Table 72.--All live tree biomass on commercial forest land by species group and forest type, Southern Lower Peninsula, Michigan, 1980

(In green tons)

| Species group | All types | Forest type | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS | | | | | | | | |
| White pine | 2,540,121 | 4,523 | 81,369 | 898,769 | -- | -- | -- | 6,054 |
| Red pine | 2,033,725 | 91 | 1,431,988 | 148,674 | -- | -- | -- | -- |
| Jack pine | 686,355 | 428,544 | 132,077 | -- | -- | -- | -- | -- |
| White spruce | 141,331 | -- | -- | -- | -- | 78,453 | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 7,227 | -- | 7,028 | -- | -- | -- | -- | -- |
| Hemlock | 327,083 | -- | -- | -- | -- | -- | -- | -- |
| Tamarack | 250,428 | -- | -- | -- | -- | -- | -- | 54,849 |
| Northern white-cedar | 206,488 | -- | -- | -- | -- | -- | -- | 83,715 |
| Other softwoods | 1,695,004 | -- | 27,461 | 93,343 | -- | 101,297 | -- | -- |
| Total | 7,887,762 | 433,158 | 1,679,923 | 1,140,786 | -- | 179,750 | -- | 144,618 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 18,060,368 | 765 | 44,705 | 26,289 | -- | -- | -- | -- |
| Select red oaks | 18,527,206 | 138,397 | 27,179 | 163,266 | -- | -- | -- | -- |
| Other red oaks | 6,339,943 | 3,157 | 753 | -- | -- | -- | -- | -- |
| Hickory | 6,301,408 | 16,357 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 589,734 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 6,573,482 | 7,273 | -- | -- | -- | -- | -- | 16,674 |
| Soft maple | 19,953,995 | 42,478 | 2,711 | 12,379 | -- | -- | -- | 60 |
| Beech | 2,531,485 | -- | 15 | -- | -- | -- | -- | -- |
| Ash | 13,110,004 | -- | -- | -- | -- | 1,155 | -- | 3,276 |
| Balsam poplar | 394,001 | -- | -- | -- | -- | -- | -- | -- |
| Cottonwood | 2,741,846 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 3,354,855 | -- | 5,854 | -- | -- | -- | -- | -- |
| Quaking aspen | 4,029,985 | 8 | 2,226 | -- | -- | -- | -- | 14,514 |
| Basswood | 3,688,929 | -- | -- | -- | -- | -- | -- | -- |
| Yellow-poplar | 698,427 | -- | 11,603 | -- | -- | -- | -- | -- |
| Black walnut | 1,413,508 | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 6,274,699 | -- | 16,388 | 59,366 | -- | 50,343 | -- | -- |
| Butternut | 277,403 | 16,485 | -- | -- | -- | -- | -- | 14,570 |
| Elm | 5,323,136 | -- | -- | -- | -- | -- | -- | 1,398 |
| Paper birch | 1,133,945 | -- | -- | -- | -- | -- | -- | 6,153 |
| Other hardwoods | 5,611,331 | 8,010 | 12,627 | -- | -- | 10,179 | -- | -- |
| Noncommercial species | 3,110,530 | 7 | 854 | -- | -- | -- | -- | -- |
| Total | 130,040,220 | 232,937 | 124,915 | 261,300 | -- | 61,677 | -- | 56,645 |
| All species | 137,927,982 | 666,095 | 1,804,838 | 1,402,086 | -- | 241,427 | -- | 201,263 |

(Table 72 continued on next page)

(Table 72 continued)

| Species group | Forest type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | |
| White pine | -- | 529,377 | 133,526 | 700,561 | 131,298 | -- | 54,644 | -- |
| Red pine | -- | 162,497 | 21,797 | 93,331 | 105,576 | -- | 69,771 | -- |
| Jack pine | -- | 111,355 | -- | 267 | -- | -- | 14,112 | -- |
| White spruce | -- | 48,180 | -- | 14,698 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | -- | -- | 199 | -- | -- | -- | -- | -- |
| Hemlock | -- | 28,204 | 35,060 | 263,819 | -- | -- | -- | -- |
| Tamarack | 94,887 | -- | 69,254 | 31,438 | -- | -- | -- | -- |
| Northern white-cedar | -- | -- | 42,519 | 65,504 | 321 | 14,429 | -- | -- |
| Other softwoods | -- | 78,986 | 19,647 | 521,032 | -- | -- | 853,238 | -- |
| Total | 94,887 | 958,599 | 322,002 | 1,690,650 | 237,195 | 14,429 | 991,765 | -- |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 13,504,724 | 1,201,003 | 3,000,452 | 276,374 | -- | 6,056 | -- |
| Select red oaks | -- | 13,245,885 | 463,436 | 4,013,933 | 441,798 | -- | 33,312 | -- |
| Other red oaks | -- | 5,479,817 | 176,520 | 598,391 | 55,645 | -- | 25,660 | -- |
| Hickory | -- | 3,863,219 | 188,585 | 2,206,427 | 26,820 | -- | -- | -- |
| Yellow birch | -- | 24,828 | 151,168 | 413,738 | -- | -- | -- | -- |
| Hard maple | -- | 422,164 | 134,063 | 5,993,308 | -- | -- | -- | -- |
| Soft maple | -- | 2,441,186 | 10,090,739 | 6,876,851 | 473,657 | 13,934 | -- | -- |
| Beech | -- | 103,503 | 104,839 | 2,299,085 | 24,043 | -- | -- | -- |
| Ash | -- | 1,233,355 | 4,560,177 | 6,939,479 | 354,359 | 7,937 | -- | 10,266 |
| Balsam poplar | -- | 12,508 | 130,436 | 82,425 | 168,632 | -- | -- | -- |
| Cottonwood | -- | 268,097 | 1,284,529 | 848,262 | 340,958 | -- | -- | -- |
| Bigtooth aspen | -- | 1,012,078 | 75,693 | 795,897 | 1,465,333 | -- | -- | -- |
| Quaking aspen | -- | 490,521 | 774,751 | 633,337 | 1,970,993 | 13,935 | 129,700 | -- |
| Basswood | -- | 326,277 | 541,544 | 2,690,433 | 59,129 | 71,546 | -- | -- |
| Yellow-poplar | -- | 87,092 | 65,748 | 533,984 | -- | -- | -- | -- |
| Black walnut | -- | 980,731 | 154,067 | 278,710 | -- | -- | -- | -- |
| Black cherry | -- | 2,037,018 | 733,992 | 3,047,950 | 287,352 | -- | 39,638 | 2,652 |
| Butternut | -- | 104,170 | 70,794 | 71,384 | -- | -- | -- | -- |
| Elm | -- | 489,733 | 2,368,214 | 2,210,907 | 213,915 | 8,659 | -- | 30,310 |
| Paper birch | -- | 104,311 | 188,694 | 332,615 | 441,093 | 61,079 | -- | -- |
| Other hardwoods | -- | 811,765 | 1,888,998 | 2,733,648 | 110,378 | 2,264 | 33,462 | -- |
| Noncommercial species | -- | 649,412 | 658,013 | 1,621,407 | 142,574 | -- | -- | 38,263 |
| Total | -- | 47,692,394 | 26,006,003 | 48,222,623 | 6,853,053 | 179,354 | 267,828 | 81,491 |
| All species | 94,887 | 48,650,993 | 26,328,005 | 49,913,273 | 7,090,248 | 193,783 | 1,259,593 | 81,491 |

## Table 73.--All live tree biomass by species group and tree biomass component, Southern Lower Peninsula, Michigan, 1980

| | | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| ecies group | All components | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| | | - - - - - - - | - - - - - -Green tons- | - - - - - - - | | |
| FTWOODS | | | | | | |
| White pine | 2,540,121 | 296,587 | 1,502,346 | 662,083 | 45,452 | 33,653 |
| Red pine | 2,033,725 | 119,963 | 1,252,617 | 574,415 | 55,438 | 31,292 |
| Jack pine | 686,355 | 118,943 | 390,096 | 176,032 | 816 | 468 |
| White spruce | 141,331 | 85,812 | 35,169 | 17,442 | 1,964 | 944 |
| Black spruce | -- | -- | -- | -- | -- | -- |
| Balsam fir | 7,227 | 199 | 4,734 | 2,294 | -- | -- |
| Hemlock | 327,083 | 33,477 | 200,365 | 93,241 | -- | -- |
| Tamarack | 250,428 | 94,929 | 102,771 | 50,424 | 1,072 | 1,232 |
| Northern white-cedar | 206,488 | 91,014 | 65,343 | 30,823 | 12,033 | 7,275 |
| Other softwoods | 1,695,004 | 609,618 | 668,982 | 301,125 | 72,337 | 42,942 |
| Total | 7,887,762 | 1,450,542 | 4,222,423 | 1,907,879 | 189,112 | 117,806 |
| ARDWOODS | | | | | | |
| Select white oaks | 18,060,368 | 859,388 | 11,153,514 | 5,310,195 | 460,574 | 276,697 |
| Select red oaks | 18,527,206 | 565,801 | 11,917,466 | 5,464,014 | 357,744 | 222,181 |
| Other red oaks | 6,339,943 | 303,576 | 3,983,708 | 1,830,284 | 142,281 | 80,094 |
| Hickory | 6,301,408 | 535,756 | 3,785,536 | 1,801,368 | 114,735 | 64,013 |
| Yellow birch | 589,734 | 137,306 | 247,162 | 116,178 | 51,416 | 37,672 |
| Hard maple | 6,573,482 | 891,250 | 3,623,043 | 1,696,351 | 219,040 | 143,798 |
| Soft maple | 19,953,995 | 2,600,468 | 10,878,382 | 5,144,938 | 800,221 | 529,986 |
| Beech | 2,531,485 | 132,535 | 1,432,763 | 688,899 | 173,553 | 103,735 |
| Ash | 13,110,004 | 3,068,321 | 6,561,124 | 3,035,815 | 283,202 | 161,542 |
| Balsam poplar | 394,001 | 26,867 | 246,442 | 111,615 | 5,000 | 4,077 |
| Cottonwood | 2,741,846 | 168,491 | 1,695,870 | 821,520 | 24,045 | 31,920 |
| Bigtooth aspen | 3,354,855 | 230,423 | 2,074,679 | 965,495 | 48,791 | 35,467 |
| Quaking aspen | 4,029,985 | 972,514 | 1,965,474 | 948,545 | 86,642 | 56,810 |
| Basswood | 3,688,929 | 404,632 | 2,107,792 | 955,161 | 137,750 | 83,594 |
| Yellow-poplar | 698,427 | 34,677 | 456,065 | 207,685 | -- | -- |
| Black walnut | 1,413,508 | 42,261 | 898,523 | 418,610 | 35,979 | 18,135 |
| Black cherry | 6,274,699 | 1,112,121 | 3,231,731 | 1,455,678 | 303,312 | 171,857 |
| Butternut | 277,403 | 83,219 | 94,920 | 44,553 | 34,490 | 20,221 |
| Elm | 5,323,136 | 2,279,040 | 1,861,124 | 915,196 | 172,822 | 94,954 |
| Paper birch | 1,133,945 | 268,403 | 567,370 | 270,097 | 17,555 | 10,520 |
| Other hardwoods | 5,611,331 | 1,506,740 | 2,277,530 | 1,098,908 | 436,890 | 291,263 |
| Noncommercial species | 3,110,530 | 2,296,474 | -- | -- | 533,285 | 280,771 |
| Total | 130,040,220 | 18,520,263 | 71,060,218 | 33,301,105 | 4,439,327 | 2,719,307 |
| l species | 137,927,982 | 19,970,805 | 75,282,641 | 35,208,984 | 4,628,439 | 2,837,113 |

(Table 73 continued on next page)

(Table 73 continued)

| | | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| Species group | All components | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| | | Thousand cubic feet | | | | |
| SOFTWOODS | | | | | | |
| White pine | 140,368 | 16,409 | 83,017 | 36,586 | 2,503 | 1,853 |
| Red pine | 99,216 | 5,817 | 61,115 | 28,026 | 2,721 | 1,537 |
| Jack pine | 28,837 | 4,951 | 16,421 | 7,410 | 35 | 20 |
| White spruce | 8,010 | 4,862 | 1,994 | 989 | 111 | 54 |
| Black spruce | -- | -- | -- | -- | -- | -- |
| Balsam fir | 330 | 9 | 216 | 105 | -- | -- |
| Hemlock | 13,760 | 1,394 | 8,438 | 3,928 | -- | -- |
| Tamarack | 10,940 | 4,173 | 4,471 | 2,194 | 47 | 55 |
| Northern white-cedar | 14,117 | 6,202 | 4,488 | 2,117 | 817 | 493 |
| Other softwoods | 81,386 | 29,395 | 32,013 | 14,418 | 3,487 | 2,073 |
| Total | 396,964 | 73,212 | 212,173 | 95,773 | 9,721 | 6,085 |
| HARDWOODS | | | | | | |
| Select white oaks | 637,389 | 29,507 | 393,898 | 187,536 | 16,501 | 9,947 |
| Select red oaks | 646,617 | 19,427 | 415,818 | 190,674 | 12,719 | 7,979 |
| Other red oaks | 218,659 | 10,274 | 137,443 | 63,156 | 4,980 | 2,806 |
| Hickory | 218,942 | 18,131 | 131,801 | 62,716 | 4,036 | 2,258 |
| Yellow birch | 22,145 | 5,086 | 9,237 | 4,346 | 1,987 | 1,489 |
| Hard maple | 248,553 | 33,537 | 136,961 | 64,124 | 8,364 | 5,567 |
| Soft maple | 861,754 | 112,210 | 469,567 | 222,090 | 34,758 | 23,129 |
| Beech | 98,420 | 5,152 | 55,647 | 26,758 | 6,791 | 4,072 |
| Ash | 553,683 | 128,293 | 277,822 | 128,568 | 12,092 | 6,908 |
| Balsam poplar | 19,996 | 1,359 | 12,506 | 5,664 | 257 | 210 |
| Cottonwood | 116,854 | 7,140 | 72,240 | 34,994 | 1,059 | 1,421 |
| Bigtooth aspen | 160,685 | 10,947 | 99,376 | 46,251 | 2,377 | 1,734 |
| Quaking aspen | 192,338 | 46,200 | 93,891 | 45,319 | 4,180 | 2,748 |
| Basswood | 183,580 | 20,032 | 104,900 | 47,552 | 6,903 | 4,193 |
| Yellow-poplar | 36,947 | 1,833 | 24,127 | 10,987 | 0 | 0 |
| Black walnut | 52,646 | 1,541 | 33,487 | 15,608 | 1,336 | 674 |
| Black cherry | 283,912 | 49,815 | 146,387 | 65,962 | 13,874 | 7,874 |
| Butternut | 12,562 | 3,728 | 4,308 | 2,023 | 1,577 | 926 |
| Elm | 209,026 | 88,593 | 73,585 | 36,193 | 6,874 | 3,781 |
| Paper birch | 47,186 | 11,172 | 23,599 | 11,235 | 738 | 442 |
| Other hardwoods | 235,424 | 62,716 | 95,434 | 46,065 | 18,697 | 12,512 |
| Noncommercial species | 130,313 | 95,587 | -- | -- | 22,739 | 11,987 |
| Total | 5,187,631 | 762,280 | 2,812,034 | 1,317,821 | 182,839 | 112,657 |
| All species | 5,584,595 | 835,492 | 3,024,207 | 1,413,594 | 192,560 | 118,742 |

✩ U.S. GOVERNMENT PRINTING OFFICE: 1983-665-728/206

Table 74.--Sampling errors[1] for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land, Southern Lower Peninsula, Michigan, 1980

| Sampling error | Commercial forest area | Growing Stock |  |  | Sawtimber |  |  |
|---|---|---|---|---|---|---|---|
|  |  | Inventory | Growth | Removals | Inventory | Growth | Removals |
| Percent | Thousand acres | - - - -Million cubic feet- - - - |  |  | - - -[2]Million board feet- - - - |  |  |
| 1 | 5,963.5 | 19,195.8 | 1,131.6 | 8,973.4 | 105,512.1 | 8,934.6 | 4,7464.4 |
| 2 | 1,490.9 | 4,798.9 | 282.9 | 2,243.3 | 26,378.0 | 2,233.6 | 11,866.1 |
| 3 | 662.6 | 2,132.9 | 125.7 | 997.0 | 11,723.6 | 992.7 | 5,273.8 |
| 4 | 372.7 | 1,199.7 | 70.7 | 560.8 | 6,594.5 | 558.4 | 2,966.5 |
| 5 | 238.5 | 767.8 | 45.3 | 358.9 | 4,220.5 | 357.4 | 1,898.6 |
| 10 | 59.6 | 192.0 | 11.3 | 89.7 | 1,055.1 | 89.3 | 474.6 |
| 15 | 26.5 | 85.3 | 5.0 | 39.9 | 468.9 | 39.7 | 211.0 |
| 20 | 14.9 | 48.0 | 2.8 | 22.4 | 263.8 | 22.3 | 118.7 |
| 25 | 9.5 | 30.7 | 1.8 | 14.4 | 168.8 | 14.3 | 75.9 |
| 50 | 2.4 | 7.7 | 0.5 | 3.6 | 42.2 | 3.6 | 19.0 |
| 100 | 0.6 | 1.9 | 0.1 | 0.9 | 10.6 | 0.9 | 4.7 |

[1] At the 68-percent probability level.

[2] International 1/4-inch rule.

Hahn, Jerold T.
Timber resource of Michigan's Southern Lower Peninsula Unit. 1980. Resour. Bull. NC-66. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 119p.

The fourth inventory of the timber resource of Michigan's Southern Lower Peninsula Survey Unit shows a 12 percent decline in commercial forest area and a 26 percent gain in growing-stock volume between 1966 and 1980. Presented are highlights and statistics on area, volume, growth, mortality, removals, utilization, and biomass.

KEY WORDS: Statistics, area, volume, growth, mortality, removals.

**United States Department of Agriculture**

Forest Service

North Central Forest Experiment Station

Resource Bulletin **NC-67**

# Michigan Forest Statistics, 1980

Gerhard K. Raile and W. Brad Smith

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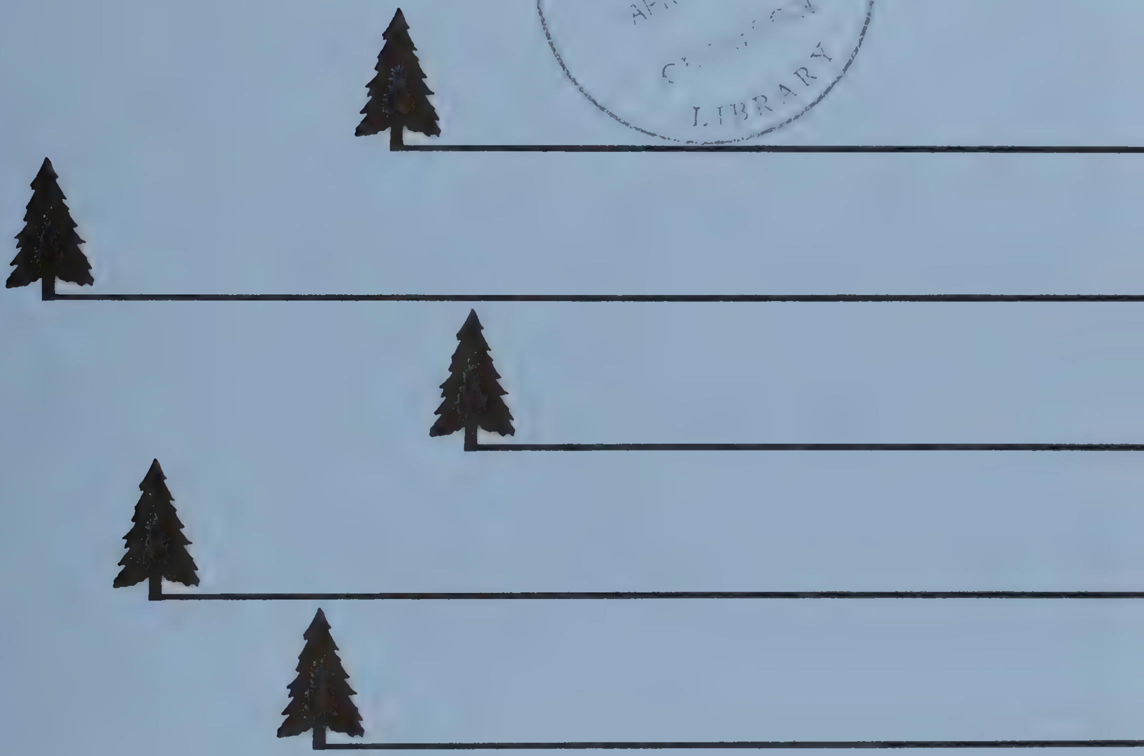

Information contained in this report includes the most commonly used Forest Inventory and Analysis statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complete retrieval involving the services of a computer programmer. If requests for data conflict with ongoing work, requests will be scheduled so as to minimize the impact on the work unit. Requests for unpublished information may be directed to:

Burton L. Essex
Forest Inventory and Analysis Project
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108
Phone: (612) 642-5282

Area served: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, Wisconsin.

**North Central Forest Experiment Station**
**Forest Service—U.S. Department of Agriculture**
**1992 Folwell Avenue**
**St. Paul, Minnesota 55108**
**Manuscript approved for publication February 24, 1983**
**December 1983**

# FOREWORD

Forest Inventory and Analysis (formerly called Resources Evaluation) is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. Up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1980 Michigan forest inventory was begun in October 1977 and completed in May 1981. Reports on the three previous surveys of Michigan's timber resource are dated 1935, 1955, and 1966.

Similar Resource Bulletins reporting statistical highlights and detailed tables of the Survey Units in Michigan (see cover) are available.

More accurate survey information was obtained during this survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding and manpower provided the North Central Station by the Michigan State Legislature through the Department of Natural Resources and by interested forest industries. Data from the Department's canvass of all primary wood-using plants in the State were used to help estimate the quantity of timber products harvested in Michigan.

Aerial photos used in the Michigan Forest Inventory were furnished by the Michigan Department of Natural Resources and the National Forests.

# CONTENTS

*Page*

Highlights . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1

Appendix . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2

- Accuracy of Survey . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
- Survey Procedures . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
- Comparing Michigan's Fourth Inventory with the Third Inventory . . . . . . . . . . . . . . . . . . . . . . . . . . 3
- Log Grade . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 4
- Metric Equivalents of Units Used in this Report . . . . . . . 8
- Tree Species Groups in Michigan . . . . . . . . . . . . . . . . . . . . 8
- Definition of Terms . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9
- Tables . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 14

# MICHIGAN FOREST STATISTICS, 1980

**Gerhard K. Raile,** *Mensurationist,*
*and* **W. Brad Smith,** *Mensurationist*

## HIGHLIGHTS

### Forest Area

- Forest land accounted for 18.4 million acres (51 percent of the State's land area) in 1980, compared to 19.4 million acres (53 percent) in 1966.

- Commercial forest land occupied 17.5 million acres (95 percent of the forest land) in 1980, compared to 18.9 million acres (97 percent) in 1966.

- Productive-reserved forest land totaled 622,100 acres in 1980, compared to 311,100 acres in 1966. Additions since 1966 include National lakeshore, military reservations, State game management areas, and State parks.

- Farmers and miscellaneous private individuals owned 7.7 million acres, 44 percent, of the commercial forest in 1980.

- The maple-birch (6.1 million acres) and aspen (3.4 million acres) forest types accounted for 54 percent of the commercial forest area.

- Poletimber stands accounted for 45 percent of the commercial forest area, followed by sawtimber stands (29 percent), sapling and seedling stands (25 percent), and nonstocked areas (1 percent).

### Timber Volume

- The volume of growing stock in 1980 was 19.1 billion cubic feet, 27 percent greater than the 15.1 billion in 1966.

- Hardwoods made up 72 percent of the growing-stock volume (13.7 billion cubic feet).

- Average growing-stock volume per acre in 1980 was 1,092 cubic feet compared to 798 cubic feet in 1966.

- Fifty-eight percent of the growing-stock volume was in trees less than 11.0 inches d.b.h.

- Sawtimber amounted to 47.7 billion board feet in 1980.

- Thirty-one percent of the growing-stock volume was in stands between 41 and 60 years old.

### Net Growth

- Net annual growth rate of growing stock was 3.5 percent of inventory. The growth rate for softwoods (3.8 percent) was higher than the growth rate for hardwoods (3.4 percent).

- Net annual growth per acre increased from 26.8 cubic feet in 1965 to 38.8 cubic feet in 1979.

- Mortality of growing-stock trees averaged 1 percent of inventory in 1979 (158.1 million cubic feet).

- Disease accounted for 39 percent of mortality.

### Timber Use

- Timber removals from growing stock totaled 274.6 million cubic feet in 1979—223.0 million for timber products, 34.8 million for other removals, and 16.8 million for logging residue.

- The aspens made up 30 percent of the 1979 growing-stock removals.

- Output of timber products from roundwood totaled 265.9 million cubic feet in 1978, 45 percent of which was pulpwood.

- Wood residue from primary plants totaled 42.8 million cubic feet in 1978, 6.1 million of which were not used.

### Biomass

- Live shrub biomass yield (including trees less than 1 inch d.b.h.) was highest in the tamarack forest type—4,533 pounds per acre.

- Live tree biomass (trees greater than 1 inch d.b.h.) totaled 1,046 million green tons.

- Fifty-one percent of all live tree biomass was in growing-stock boles.

# APPENDIX

## ACCURACY OF SURVEY

Forest Inventory and Analysis information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit level. Consequently, the reported figures are estimates only. A measure of reliability of these figures is given by sampling errors. These sampling errors mean the chances are two out of three that the ture inventory value is within the limits indicated.

For example, the estimated growing-stock volume in Michigan in 1980, 19,103.8 million cubic feet, has a sampling error of ±0.70 percent (±133.7 million cubic feet). Therefore, the growing-stock volume from a 100-percent inventory, would have a two in three chance of falling between 18,970.1 and 19,237.5 million cubic feet.

The following tabulation shows the sampling errors for the 1980 Michigan inventory:

| Item | State totals | Sampling error |
|---|---|---|
| Growing stock | (Million cubic feet) | (Percent) |
| Volume | 19,103.8 | 0.70 |
| Growth | 677.8 | 1.04 |
| Removals | 274.6 | 7.17 |
| Sawtimber | (Million board feet) | |
| Volume | 47,669.1 | 1.08 |
| Growth | 2,384.4 | 1.74 |
| Removals | 915.5 | 8.31 |
| Commercial forest land area | (Thousand acres)<br>17,489.5 | <br>0.33 |

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for growing-stock volume in a particular Unit or county is higher than that for total growing-stock volume in the State (table 74 shows the sampling errors for estimates smaller than State totals).

## SURVEY PROCEDURES

The major steps in the survey of Michigan were as follows:

1. A total of 176,976 1-acre points were systematically distributed across aerial photos of the entire State, except the National Forests. In order to make a preliminary estimate of forest area, these points were classified into land classes as shown below. Next, a total of 83,103 of these points were stereoclassified by forest type, stand-size class, and density. Finally, 13,991 points were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken.

| Land class | Photo points Classified | Photo points Stereoclassified | Ground plots visited |
|---|---|---|---|
| Forest land | 82,170 | 82,170 | 7,706 |
| Unproductive forest land | 114 | 114 | 16 |
| Nonforest land | | | |
| with trees | 3,029 | 182 | 182 |
| without trees | 86,327 | 0 | 5,626 |
| water | 4,699 | 0 | 379 |
| Questionable | 637 | 637 | 82 |
| Total | 176,976 | 83,103 | 13,991 |

At each forest ground plot location, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre. Tree measurements made at these locations and at 775 plots established in 1966 and remeasured in 1980 were the basis for estimates of timber volume, growth, mortality, number of trees, and other forest classifications on non-National Forest land. Estimates for National Forest land were based on 588 plots established between 1976 and 1980 on the Huron-Manistee, Hiawatha, and Ottawa National Forests.

2. Growth and mortality on all commercial forest land were estimated using the Stand and Tree Evaluation and Modeling System (STEMS)[1] after the System was adjusted with factors derived from the remeasurement of plots established in 1965. STEMS is an individual-tree growth projection system that uses the following stand and tree characteristics to simulate tree growth by updating tree diameter and tree status (live, dead or cut): species, tree diameter, crown ratio, site index, basal area, and average stand diameter. These characteristics were used to produce growth and mortality rates that were adjusted based on remeasurement plot information and applied to the original tree list to yield an updated tree list. Net volume equations were applied to the original and updated tree lists to estimate volumes of growth and mortality.

---

[1] *For more information on STEMS, see: Belcher, D. L.; Holdaway, M. R.; Brand, G. J. STEMS: The stand and tree evaluation and modeling system. Gen. Tech. Rep. NC-79. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1982. 18 p.*

3. Under an agreement with National Forest Region 9, North Central Station crews established 10-point variable radius plots on the Hiawatha and Huron-Manistee National Forests in 1976; and the Ottawa National Forest in 1980. National Forest personnel provided the Station with the area of commercial forest land by forest type, stand-size class, and density for the Forest, and the North Central Station computed all area and volume data in the same manner non-National Forest data were computed. Data from the Hiawatha and Huron-Manistee forests were updated with STEMS to provide current estimates of volume, growth, removals, and mortality. Area and volume tables were approved by the Forest staff before publication.

4. Statistics on timber utilization during 1978 were obtained from mill surveys. The Michigan Department of Natural Resources canvassed resident sawmills, veneer mills, and other primary wood-using plants. The North Central Forest Experiment Station canvassed out-of-State sawmills, pulpmills, and veneer mills to determine their use of Michigan timber. Fuelwood and fencepost output was based on a sample of public and private landowners to determine their production of fuelwood and fenceposts and on a canvass of industrial and public timber owners. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Michigan primary wood-using plants. Timber cut for products by ownership class was determined by a canvass of public and industrial timber owners. The portion of timber cut unaccounted for by the latter owners was grouped under "farmer and other owners".

5. A total of 2,239 felled trees on 123 active logging operations were measured throughout the State during 1977 and 1978 to develop wood utilization factors for converting timber products output to timber removals for saw logs and pulpwood. Factors for all other products were obtained during the 1964-1965 Michigan utilization study.

# COMPARING MICHIGAN'S FOURTH INVENTORY WITH THE THIRD INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for each Forest Survey Unit in Michigan to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

## Identifying and Correcting Definitional or Procedural Changes

In Michigan, definitional or procedural changes between the 1966 and 1980 inventories included changes in (1) the definitions of ownership classes, (2) the definition of productive-reserved forest land, (3) procedures for determining the area of nonforest land by land class, and (4) the volume equations.

In 1966, State Forest was a separate owner class and included only land on State Forests. Other forested State-owned land was included under the Other Public ownership class. In 1980, the State owner class included all State land. However, State-owned commercial forest land outside the State Forest areas is small in Michigan and general comparisons may be made between the 1966 and 1980 State estimates.

Some mining companies were called diversified forest industry in 1966 and classed under the Forest Industry ownership class. In 1980 these companies were classed under Miscellaneous Private Corporation ownership class. Therefore, a comparison of statistics for Forest Industry owner between 1966 and 1980 is possible only if Forest Industry and Miscellaneous Private Corporation ownerships are combined in 1980.

During the 1966 forest inventory, Christmas tree plantations were classified as commercial forest land, whereas now they are classified as productive-reserved forest land. The 1966 commercial forest and productive-reserved areas were adjusted so that they are comparable to 1980 estimates.

In the 1966 forest inventory, the 1964 Census of Agriculture estimates of cropland, pasture, and rangeland areas were used in our inventory report tables. The 1980 inventory estimates of cropland, pasture, and rangeland come from aerial photo interpretation done by Forest Inventory and Analysis personnel in St. Paul. The published 1966 estimates of cropland and pasture and rangeland areas were adjusted to be compatible with 1980 estimates.

The volume equations used in 1980 give more accurate estimates of tree volume than those used in 1966. Therefore, the 1966 volumes were adjusted by factors derived from the 1980 volume equations to make them comparable to 1980 volumes.

## Checking for Consistency

A test was made to ensure that it was possible to move from the adjusted 1966 resource statistics to the 1980 values by means of Timber Resource Analysis System (TRAS), a USDA Forest Service computer program for updating, backdating, and projecting timber volume, growth, mortality, and removals. Using the adjusted 1966 numbers of softwood and hardwood trees by 2-inch diameter class and applying 1980 cubic feet per tree estimates, 1966 softwood and hardwood volumes were generated that are comparable with 1980 volumes. Then, using growth rates, mortality rates, and removals rates for the period between the two surveys, TRAS moved from 1966 to 1980. The program prints out volumes for softwoods and hardwoods by diameter class for each year in the period. Thus, inconsistencies in volume, growth, mortality, and removals were identified and resolved.

TRAS generates an estimate of what total removals had to be in order for the inventory to have changed as it did between surveys, given the volume, growth, and mortality inputs. Estimates of removals for products and for logging residues two of the three components of total timber removals are available from an independent utilization study. An estimate of "other" removals (see Definition of Terms in Appendix), the third component of total removals, is made by subtracting the first two removals components from the TRAS-generated total removals estimate. This estimate of "other" removals is compared with findings from remeasurement plots and new plots (stump counts and land use change) to check its validity. If necessary, TRAS is rerun and adjusted until other removals are compatible with the estimate from field data. Total removals are "trend level removals" because the estimate of "other" removals is based on a removals trend line from 1966 to 1980.

## LOG GRADE

In Michigan the butt log of every sawtimber tree on every full permanent sample plot was graded for quality. Additionally, all of the logs were graded in a smaller sample of trees throughout the State. The volume yield by log grade for each tree in the latter sample was used to distribute the volume of trees in the former sample into log-grade classes. The resulting volumes by log-grade classes were expanded to provide an estimate for the entire State.

Logs were graded on the basis of external characteristics as indicators of quality. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber."[2] The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

---

[2] *Vaughn, C. L.; Wollin, C. A.; McDonald, K. A.; Bulgrin, E. H. Hardwood log grades for standard lumber. Res. Pap. FPL-63. Madison, WI: U.S. Department of Agriculture, Forest Service Forest Products Laboratory; 1966. 52 p.*

# Forest Service standard grades for hardwood factory saw logs

| Grading factors | | Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Log grade 1 | | | Log grade 2 | | | | Log grade 3 |
| Position in tree | | Butts only | Butts and uppers | | Butts and uppers | | | | Butts and uppers |
| Scaling diameter, inches | | 13-15[1] | 16-19 | 20+ | 11+[2] | 12+ | | | 8+ |
| Length without trim, feet | | 10+ | | | 10+ | 8-9 | 10-11 | 12+ | 8+ |
| Required clear cuttings[3] of each of three best faces[4] | Min. length, feet | 7 | 5 | 3 | 3 | 3 | 3 | 3 | 2 |
| | Max. number | 2 | 2 | 2 | 2 | 2 | 2 | 3 | No Limit |
| | Min. proportion of log length required in clear cutting | 5/6 | 5/6 | 5/6 | 2/3 | 3/4 | 2/3 | 2/3 | 1/2 |
| Maximum sweep and crook allowance | For logs with less than one-fourth of end in sound defects | 15 percent | | | 30 percent | | | | 35 percent |
| | For logs with more than one-fourth of end in sound defects | 15 percent | | | 20 percent | | | | 35 percent |
| Maximum scaling deduction | | 40 percent[5] | | | 50 percent[6] | | | | 50 percent |

[1] Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.

[2] Ten-inch logs of all species can be #2 if they otherwise meet requirements for small #1's.

[3] A clear cutting is a portion of a face, extending the width of the face, that is free of defects.

[4] A face is one-fourth of the surface of the log as divided lengthwise.

[5] Otherwise #1 logs with 41-60 percent deductions can be #2.

[6] Otherwise #2 logs with 51-60 percent deductions can be #3.

# Forest Service standard specifications for hardwood construction logs (tie and timber logs)[1]

| | | |
|---|---|---|
| Position in tree | | Butt and upper |
| Min. diameter, small end | | 8 inches + |
| Min. length, without trim | | 8 feet |
| Clear cuttings | | No requirements. |
| Sweep allowance, absolute | | One-fourth of the diameter at the small end for each 8 feet of length. |
| Sound surface defects | Single knots | Any number, if no one knot has an average age diameter above the callus in excess of one-third of log diameter at point of occurrence. |
| | Whorled knots | Any number if sum of knot diameters above the callus does not exceed one-third of log diameters at point of occurrence. |
| | Holes | Any number provided none has a diameter over one-third of log diameter at point of occurrence, and none extends over 3 inches into included timber.[2] |
| Unsound surface defects | | Same requirements as for sound defects if they extend into included time.[2] No limit if they do not. |
| End defects | Sound | No requirements. |
| | Unsound | None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth of the scaling diameter will admit a longitudinal split not extending over 5 inches into the contained timber. |

[1] These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only nonfactory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection for construction logs is given first priority, then it may be necessary to subdivide the class into grades.

[2] Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications:

# Log Grades for Eastern White Pine

| Log grade | Minimum size Diameter | Minimum size Length[1] | Sweep or crook allowance | Total cull allowance including sweep | Maximum weevil injury | Allowable knot size (inches)[2] on three best faces or minimum clearness of four faces |
|---|---|---|---|---|---|---|
| | *Inches* | *Feet* | --------*Percent*-------- | | *Number* | *Inches* |
| 1 | 12 & 13 | 8-16 | 20 | 50 | 0 | Four faces clear full length |
| | 14 + | 10-16 | 20 | 50 | 0 | Two faces clear full length, or four faces clear 50 percent length (6 feet min. length)[3] |
| 2 | 6 + | 8-16 | 30 | 50 | 0 | Sound knots l.e.[4] D/6 and less than 3 inches[5]<br>Unsound knots: l.e. 1½ inches and for: butt, lots l.e. D/12 upper logs l.e. D/10 or four faces clear 50 percent of length |
| 3 | 6 + | 8-16 | 40 | 50 | 8-foot logs 1 weevil<br>10-foot + logs: 2 weevil | Sound knots l.e. D/3 and less than 5 inches.<br>Unsound knots l.e. D/6 and less than 2½ inches. |
| 4 | 6 + | 8-16 | 50 | 50 | No limit | No limit |

[1] Plus trim.

[2] Disregard all knots less than ½-inch diameter in all grades.

[3] The sum of the diameter of sound knots plus twice the sum of the diameter of unsound knots (in inches) is less than or equal to ½ of the diameter of the log (inches).

[4] l.e. means less than or equal to.

[5] D means d.i.b. of log at location of knot.

# Log Grades for Jack Pine and Red Pine

*Grade 1:* logs with three or four clear faces.[3]

*Grade 2:* logs with one or two clear faces.

*Grade 3:* logs with no clear faces.

After the tentative log grade is established, the log will be degraded one grade for each of the following, except that no log can be degraded below grade 3. Net scale after deduction for defect must be at least 50 percent of the gross contents of the log.

1. *Sweep.* Degrade any tentative 1 or 2 log one grade if sweep amounts to 3 or more inches and equals or exceeds one-third the diameter inside bark at small end.

2. *Heart rot.* Degrade any tentative 1 or 2 log grade if conk, massed hyphae, or other evidence of advance heart rot is found anywhere in it.

# Log Grades for All Other Softwood Logs

**Grade 1**

1. Logs must be 16 inches in diameter or larger, 10 feet or longer, and with deduction for defect not over 30 percent of gross scale.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not over 2-½ inches in size.

**Grade 2**

1. Logs must be 12 inches in diameter or larger, 10 feet or longer, and with a net scale after deduction

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*[3] A face is one-fourth of the circumference in width extending full length of the log. Clear faces are those free of: knots measuring more than ½-inch in diameter, overgrown knots of any size, holes more than ¼-inch in diameter. Faces may be rotated to obtain the maximum number of clear ones.*

for defect of at least 50 percent of the gross contents of the log.

2. Logs must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

**Grade 3**

1. Logs must be 6 inches in diameter or larger, 8 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.

Note: (A) Diameters are diameter inside bark (d.i.b.) at small end of log.
(B) Percent clear refers to percent clear in one continuous section.

## METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International ¼-inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilogram.
1 ton = 0.907 metric ton.

## TREE SPECIES GROUPS IN MICHIGAN[4]

| | |
|---|---|
| Softwoods | |
| Eastern white pine | *Pinus strobus* |
| Red pine | *Pinus resinosa* |
| Jack pine | *Pinus banksiana* |
| White spruce | *Picea glauca* |
| Black spruce | *Picea mariana* |
| Balsam fir | *Abies balsamea* |
| Eastern hemlock | *Tsuga canadensis* |
| Tamarack | *Larix laricina* |
| Northern white-cedar | *Thuja occidentalis* |
| Other softwoods | |
| Eastern redcedar | *Juniperus virginiana* |
| Norway spruce | *Picea abies* |
| Engelmann spruce | *Picea engelmannii* |
| Austrian pine | *Pinus nigra* |
| Scotch pine | *Pinus sylvestris* |

| | |
|---|---|
| Hardwoods | |
| White oaks | |
| White oak | *Quercus alba* |
| Swamp white oak | *Quercus bicolor* |
| Bur oak | *Quercus macrocarpa* |
| Chinkapin oak | *Quercus muehlenbergii* |
| Chestnut oak | *Quercus prinus* |
| Northern red oak | *Quercus rubra* |
| Other red oaks | |
| Scarlet oak | *Quercus coccinea* |
| Northern pin oak | *Quercus ellipsoidalis* |
| Pin oak | *Quercus palustris* |
| Black oak | *Quercus velutina* |
| Hickories | |
| Bitternut hickory | *Carya cordiformis* |
| Pignut hickory | *Carya glabra* |
| Shellbark hickory | *Carya laciniosa* |
| Shagbark hickory | *Carya ovata* |
| Mockernut hickory | *Carya tomentosa* |
| Yellow birch | *Betula alleghaniensis* |
| Hard maples | |
| Sugar maple | *Acer saccharum* |
| Black maple | *Acer nigrum* |
| Soft maples | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| American beech | *Fagus grandifolia* |
| Ashes | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Balsam poplar | *Populus balsamifera* |
| Eastern cottonwood | *Populus deltoides* |
| Aspens | |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| Basswood | *Tilia americana* |
| Yellow poplar | *Liriodendron tulipifera* |
| Black walnut | *Juglans nigra* |
| Black cherry | *Prunus serotina* |
| Butternut | *Juglans cinerea* |
| Elms | |
| American elm | *Ulmus americana* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomasii* |
| Paper birch | *Betula papyrifera* |
| Other hardwoods | |
| Boxelder | *Acer negundo* |
| Sweet birch | *Betula lenta* |
| River birch | *Betula nigra* |
| Black willow | *Salix nigra* |
| Ohio buckeye | *Aesculus glabra* |
| Flowering dogwood | *Cornus florida* |
| Honeylocust | *Gleditsia triacanthos* |
| Osage orange | *Maclura pomifera* |
| Black tupelo | *Nyssa sylvatica* var. *sylvatica* |
| Sycamore | *Platanus occidentalis* |
| Black locust | *Robinia pseudoacacia* |
| Sassafras | *Sassafras albidum* |
| Red mulberry | *Morus rubra* |
| American chestnut | *Castanea dentata* |

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[4] *The common and scientific names are based on: Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handb. 541. Washington, DC: U.S. Department of Agriculture, Forest Service, 1979. 375 p.*

# DEFINITION OF TERMS

**Acceptable trees.**—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

**Area-condition classes.**—*Class 10.*—Areas fully stocked with desirable trees but not overstocked.

*Class 20.*—Areas fully stocked with desirable trees but overstocked with all live trees.

*Class 30.*—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

*Class 40.*—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

*Class 50.*—Areas poorly stocked with desirable trees but fully stocked with growing-stock trees.

*Class 60.*—Areas poorly stocked with desirable trees but with medium to full stocking of growing-stock trees.

*Class 70.*—Areas poorly stocked with desirable trees and poorly stocked with growing-stock trees.

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Biomass.**—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of 5 components:

*Growing-stock bole.*—Biomass of a growing-stock tree from a 1-foot stump to a variable 4-inch top.

*Growing-stock tops and limbs.*—Biomass of a growing-stock tree from a 1-foot stump minus the growing-stock bole.

*Cull bole.*—Biomass of a cull tree from a 1-foot stump to a variable 4-inch top.

*Cull tops and limbs.*—Biomass of a cull tree from a 1-inch stump minus the cull bole.

*1- to 5-inch trees.*—Biomass of all live trees 1- to 5-inches in diameter at breast height.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

**County and municipal land.**—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

**Cull.**—Portions of a tree that are unusable for industrial wood products, because of rot, form, or other defect.

**Desirable trees.**—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

**Diameter classes.**—A classification of trees based on diameter outside bark, measured at breast height (4-½ feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Survey, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h. inclusive.)

**Farm.**—Either a place operated as a unit of 10 or more acres from which the sale of agricultural products totals $50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least $250. Places having less than the $50 or $250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce goods in sufficient quantity to meet the requirements of the definition.

**Farmer-owned land.**—Land owned by farm operators. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest trees.**—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

**Forest type.**—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Michigan are:

*Jack pine.*—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

*Red pine.*—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

*White pine.*—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

*Balsam fir.*—Forests in which balsam fir and white spruce comprise a plurality of stocking with balsam fir the most common. (Common associates include white spruce, aspen, maple, birch, northern white-cedar, and tamarack.)

*White spruce.*—Forests in which white spruce and balsam fir comprise a plurality of the stocking with white spruce the most common. (Common associates include balsam fir, aspen, maple, birch, northern white-cedar, and tamarack.)

*Black spruce.*—Forests in which swamp conifers comprise a plurality of the stocking with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

*Northern white-cedar.*—Forests in which swamp conifers comprise a plurality of the stocking with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

*Tamarack.*—Forests in which swamp conifers comprise a plurality of the stocking with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

*Oak-hickory.*—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, beech, yellow-poplar, elm, and maple.)

*Elm-ash-soft maple.*—Forests in which lowland elm, ash, cottonwood, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include birches, spruce, and balsam fir.)

*Maple-birch.*—Forests in which sugar maple, basswood, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, hemlock, and basswood.)

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

*Paper birch.*—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

*Exotic.*—Forests in which species not native to Michigan comprise a plurality of the stocking. (Mostly scotch pine plantations.)

**Gross area.**—The entire area of land and water as determined by the Bureau of the Census, 1970.

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by dividing by 79 cubic feet per solid wood cord.

**Hardwoods.**—Dicotyledonous trees, usually broad-leaved and deciduous.

**Idle farmland.**—Includes former croplands, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

**Improved pasture.**—Land currently improved for grazing, by cultivation, seeding, irrigation, or clearing of trees or brush and less than 16.7 percent stocked with live trees.

**Indian land.**—Tribal lands held in fee but administered by the Federal Government.

**Land area.**—A. *Bureau of the Census.* —The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Survey.* —The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Live trees.**—Growing-stock, rough and rotten trees 1 inch d.b.h. and larger.

**Log grades.**—A classification of logs based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

**Logging residues.**—The unused growing stock portions of trees cut or killed by logging.

**Maintained road.**—Any road, hard-topped or other surfaces, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

**Marsh.**—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

**Merchantable.**—Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

**Miscellaneous Federal land.**—Federal land other than National Forest, and land administered by the Bureau of Land Management.

**Miscellaneous private land.**—Privately owned land other than forest-industry and farmer-owned land.

**Mortality.**—The volume of sound wood in growing-stock and sawtimber trees that die annually.

**National Forest land.**—Federal land that have been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

**Net annual growth of growing stock.**—The annual change in volume of sound wood in live sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

**Net annual growth of sawtimber.**—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

**Net volume.**—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land.

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area, to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Other removals.**—Growing-stock trees removed but not utilized for products, or trees left standing but "removed" from the commercial forest land classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

**Ownership.**—Property owned by one owner, regardless of the number of parcels in a specified area.

**Ownership size class.**—The amount of commercial forest land owned by one owner, regardless of the number or parcels.

**Owner tenure.**—The length of time a property has been held by the owner.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Forest Inventory and Analysis inventories are:

*Xeric sites.*—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

**Plant byproducts.**—Plant residues used for products such as mulch, pulp chips, and fuelwood.

**Plant residues.**—Wood and bark materials generated at manufacturing plants during production of other products.

**Poletimber stands.**—(See stand-size class.)

**Poletimber trees.**—Growing-stock trees of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administration regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten trees.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough trees.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Roundwood products.**—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs, veneer logs and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

**Salvable dead trees.**—Standing or down dead trees that are considered merchantable by Regional standards.

**Saplings.**—Live trees 1.0 to 5.0 inches d.b.h.

**Sapling-seedling stands.**—(See stand-size class.)

**Saw log.**—A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by Regional standards.

**Saw log portion.**—That part of the bole of sawtimber trees between the stump and the saw log top.

**Saw log top.**—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

**Sawtimber stands.**—(See stand-size class.)

**Sawtimber trees.**—Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting Regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

**Sawtimber volume.**—Net volume of the saw log portion of live sawtimber in board feet, International ¼-inch rule, from stump to a minimum 7 inches top diameter outside bark (d.o.b.) for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

**Seedlings.**—Live trees less than 1.0 inch d.b.h. that are expected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Short-log (rough tree).**—Sawtimber-size trees of commercial species that contain at least one merchantable 8-to 11-foot saw log but not a 12-foot saw log.

**Shrub biomass.**—The total above-ground weight (including the bark) of selected shrubs and trees less than 1 inch d.b.h.

**Site class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-area class.**—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

**Stand-size class.**—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings.

a. *Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

b. *Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

c. *Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

d. *Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

**State land.**—Land owned by States, or land leased to these governmental units for 50 years or more.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Timber removals from growing stock.**—The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals.

**Timber removals from sawtimber.**—The net board-foot volume of live sawtimber trees removed for forest products annually (including roundwood products and logging residues) and for other removals.

**Timber products output.**—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

**Tree biomass.**—The total aboveground weight (including the bark) of all trees 1 to 5 inches in d.b.h., and the total aboveground weight (including the bark) from a 1-foot stump for trees more than 5 inches in diameter.

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

**Upper stem portion.**—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

**Urban and other areas.**—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards, cemeteries, roads; railroads; airports; beaches; powerlines; and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing.

**Wooded strip.**—An acre or more of natural continuous forest land that would otherwise meet survey standards for commercial forest land except that it is less than 120 feet wide.

# TABLES

## AREA

Table 1.—Area of land by land class, 1966 and 1980

Table 2.—Area of land by land use class and Forest Survey Unit

Table 3.—Area of commercial forest land by ownership class and Forest Survey Unit

Table 4.—Area of land and forest land by county and Forest Survey Unit

Table 5.—Area of commercial forest land by ownership class and site class

Table 6.—Area of commercial forest land by ownership class andstand-volume class

Table 7.—Area of privately owned commercial forest land by ownershipclass, owner tenure, and size of owner

Table 8.—Area of commercial forest land by forest type, stand-size class, and ownership class

Table 9.—Area of commercial forest land by forest type and Forest Survey Unit

Table 10.—Area of commercial forest land by county, stand-size class, and Forest Survey Unit

Table 11.—Area of commercial forest land by forest type, stand-size class, and site class

Table 12.—Area of commercial forest land by forest type and stand-age class

Table 13.—Area of commercial forest land by forest type, site-index class, and Forest Survey Unit

Table 14.—Area of commercial forest land by forest type, stand-size class, and basal-area class

Table 15.—Area of commercial forest land by stocking class of growing-stock trees and stand-size class

Table 16.—Area of commercial forest land by stocking class based on selected stand components

Table 17.—Area of noncommercial forest land by ownership class

Table 18.—Area of noncommercial forest land by forest type

Table 19.—Area of nonforest land with trees by forest type and land use

## NUMBER OF TREES

Table 20.—Number of all live trees on commercial forest land by species group and diameter class

Table 21.—Number of growing-stock trees on commercial forest land by species group and diameter class

Table 22.—Number of short-log trees on commercial forest land by species group and diameter class

## VOLUME

Table 23.—Net volume of growing stock on commercial forest land by species, 1966 and 1980

Table 24.—Net volume of all live trees on commercial forest land by species group and diameter class

Table 25.—Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods

Table 26.—Net volume of growing-stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species

Table 27.—Net volume of noncommercial species on commercial forest land by individual species

Table 28.—Net volume of growing stock on commercial forest land by species group and Forest Survey Unit

Table 29.—Net volume of sawtimber on commercial forest land by species group and Forest Survey Unit

Table 30.—Net volume of growing stock on commercial forest land by species group and diameter class

Table 31.—Net volume of sawtimber on commercial forest land by species group and diameter class

Table 32.—Net volume of growing stock on commercial forest land by species group and forest type

Table 33.—Net volume of sawtimber on commercial forest land by species group and forest type

Table 34.—Net volume of growing stock on commercial forest land by species group and ownership class

Table 35.—Net volume of sawtimber on commercial forest land by species group and ownership class

Table 36.—Net volume of growing stock on commercial forest land by forest type and stand-age class

Table 37.—Net volume of sawtimber on commercial forest land by forest type and stand-age class

Table 38.—Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 39.—Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 40.—Net volume of sawtimber on commercial forest land by species group and log-grade class

Table 41.—Net volume of short-log trees on commercial forest land by species group and diameter class

Table 42.—Net volume of short-log trees on commercial forest land by species group and diameter class

## GROWTH AND REMOVALS

Table 43.—Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, 1965-1979

Table 44.—Net annual growth of growing stock on commercial forest land by species group and Forest Survey Unit

Table 45.—Net annual growth of sawtimber on commercial forest land by species group and Forest Survey Unit

Table 46.—Net annual growth of growing stock on commercial forest land by species group and ownership class

Table 47.—Net annual growth of sawtimber on commercial forest land by species group and ownership class

Table 48.—Net annual growth of growing stock on commercial forest land by species group and forest type

Table 49.—Net annual growth of sawtimber on commercial forest land by species group and forest type

Table 50.—Net annual growth of growing stock on commercial forest land by forest type and stand-age class

Table 51.—Net annual growth of sawtimber on commercial forest land by forest type and stand-age class

Table 52.—Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 53.—Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 54.—Timber removals from growing stock on commercial forest land by species group and Forest Survey Unit

Table 55.—Timber removals from sawtimber on commercial forest land by species group and Forest Survey Unit

Table 56.—Timber removals from growing stock and sawtimber on commercial forest land by species group, 1965 and 1979

Table 57.—Timber removals from growing stock and sawtimber on commercial forest land by item and species category

Table 58.—Net annual growth and removals of growing stock on commercial forest land by species group

Table 59.—Net annual growth and removals of sawtimber on commercial forest land by species group

Table 60.—Net annual growth and removals of growing stock on commercial forest land by ownership class and softwoods and hardwoods

Table 61.—Net annual growth and removals of sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## MORTALITY

Table 62.—Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, 1965 and 1979

Table 63.—Annual mortality of growing stock on commercial forest land by species group and cause

Table 64.—Annual mortality of sawtimber on commercial forest land by species group and cause

Table 65.—Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## UTILIZATION

Table 66.—Output of timber products by product, softwoods and hardwoods, and source of material

Table 67.—Output of roundwood products by product, softwoods and hardwoods, and source of material

Table 68.—Timber products from roundwood by species group and product

Table 69.—Volume of primary plant residue by use and type of residue

## BIOMASS

Table 70.—All live shrub biomass yields on commercial forest land by shrub species group and forest type

Table 71.—All live tree biomass yields on commercial forest land by species group and forest type

Table 72.—All live tree biomass on commercial forest land by species group and forest type

Table 73.—All live tree biomass by species group and tree biomass component

## SAMPLING ERRORS

Table 74.—Sampling errors for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land

Table 1.--Area of land by land class, Michigan 1966[1] and 1980

(In thousand acres)

| Land class | 1966[1] | 1980 |
|---|---|---|
| FOREST LAND | | |
| Commercial forest | | |
| Jack pine | 883.5 | 836.7 |
| Red pine | 594.8 | 655.9 |
| White pine | 147.9 | 214.1 |
| Balsam fir-white spruce | 1,071.9 | 735.5 |
| Black spruce | 421.1 | 520.6 |
| Northern white-cedar | 1,166.0 | 1,173.6 |
| Tamarack | 168.9 | 114.8 |
| Oak-hickory | 2,360.9 | 1,773.6 |
| Elm-ash-soft maple | 1,897.1 | 1,326.4 |
| Maple-birch | 5,215.8 | 6,098.4 |
| Aspen | 4,150.4 | 3,406.6 |
| Paper birch | 416.5 | 374.8 |
| Exotic | 86.2 | 86.3 |
| Nonstocked | 276.3 | 172.2 |
| Subtotal | 18,857.3 | 17,489.5 |
| Noncommercial forest land | | |
| Unproductive | 205.0 | 257.2 |
| Productive-reserved | 311.1 | 622.1 |
| Subtotal | 516.1 | 879.3 |
| Total | 19,373.4 | 18,368.8 |
| NONFOREST LAND | | |
| Cropland | 9,713.8 | 12,292.7 |
| Pasture and range | 1,624.6 | 1,338.5 |
| Other | 5,780.3 | 4,362.9 |
| Total | 17,118.7 | 17,994.1 |
| TOTAL LAND | [2]36,492.1 | [3]36,362.9 |
| WATER (BUREAU OF THE CENSUS) | [2]766.1 | [3]895.3 |
| TOTAL LAND AND WATER | [2]37,258.2 | [3]37,258.2 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

[2] U.S. Department of Commerce, Bureau of Census. 1950.

[3] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 2.--Area of land by land use class and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| Land use class | All Units | Forest Survey Unit<br>Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| FOREST LAND | | | | | |
| Commercial forest | 17,489.5 | 3,801.6 | 4,529.6 | 6,694.9 | 2,463.4 |
| Unproductive forest | 257.2 | 102.4 | 62.2 | 87.7 | 4.9 |
| Productive reserved | 622.1 | 127.6 | 266.7 | 147.0 | 80.8 |
| Total | 18,368.8 | 4,031.6 | 4,858.5 | 6,929.6 | 2,549.1 |
| NONFOREST LAND | | | | | |
| Nonforest with trees | | | | | |
| Cropland with trees | 96.8 | 3.4 | 3.5 | 46.7 | 43.2 |
| Improved pasture with trees | 82.2 | 2.5 | 12.7 | 62.3 | 4.7 |
| Wooded strips | 241.3 | 24.9 | -- | 33.8 | 182.6 |
| Idle farmland with trees | 12.8 | 1.8 | -- | 2.3 | 8.7 |
| Marsh with trees | 235.3 | 49.0 | 15.1 | 97.8 | 73.4 |
| Urban and other windbreaks | -- | -- | -- | -- | -- |
| Windbreaks | 37.5 | 1.7 | -- | 7.5 | 28.3 |
| Wooded pasture | 13.4 | -- | 1.8 | 2.2 | 9.4 |
| Subtotal | 719.3 | 83.3 | 33.1 | 252.6 | 350.3 |
| Nonforest without trees | | | | | |
| Cropland without trees | 11,718.3 | 446.4 | 189.2 | 2,384.1 | 8,698.6 |
| Improved pasture without trees | 1,254.5 | 1.8 | 141.5 | 692.5 | 418.7 |
| Idle farm without trees | 19.8 | 2.0 | -- | 2.5 | 15.3 |
| Marsh without trees | 628.5 | 240.3 | 89.1 | 166.7 | 132.4 |
| Other farm-farmstead | 477.6 | 17.4 | 31.8 | 172.4 | 256.0 |
| Urban and other | 3,105.6 | 162.5 | 183.2 | 727.6 | 2,032.3 |
| Noncensus water | 70.5 | 13.7 | -- | 22.7 | 34.1 |
| Subtotal | 17,274.8 | 884.1 | 634.8 | 4,168.5 | 11,587.4 |
| Total | 17,994.1 | 967.4 | 667.9 | 4,421.1 | 11,937.7 |
| TOTAL LAND | [1]36,362.9 | 4,999.0 | 5,526.4 | 11,350.7 | 14,486.8 |
| WATER (BUREAU OF THE CENSUS) | [1]895.3 | 165.8 | 167.0 | 362.6 | 199.9 |
| TOTAL LAND AND WATER | [1]37,258.2 | 5,164.8 | 5,693.4 | 11,713.3 | 14,686.7 |

[1] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20 No. 1.

Table 3.--Area of commercial forest land by ownership class and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| Ownership Class | All Units | Forest Survey Unit<br>Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| National Forest | 2,441.5 | 741.4 | 827.7 | 859.5 | 12.9 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- |
| Miscellaneous federal | 44.9 | 20.6 | 1.6 | 15.1 | 7.6 |
| Indian | 22.3 | 6.0 | 16.3 | -- | -- |
| State | 3,571.3 | 976.6 | 620.3 | 1,825.1 | 149.3 |
| County and municipal | 186.7 | 8.9 | 87.6 | 37.6 | 52.6 |
| Forest industry | 1,980.8 | 635.5 | 1,269.3 | 76.0 | -- |
| Farmer | 3,097.7 | 478.2 | 194.1 | 1,274.5 | 1,150.9 |
| Misc. private-corp. | 1,510.5 | 227.9 | 668.4 | 474.0 | 140.2 |
| Misc. private-indiv. | 4,633.8 | 706.5 | 844.3 | 2,133.1 | 949.9 |
| All owners | 17,489.5 | 3,801.6 | 4,529.6 | 6,694.9 | 2,463.4 |

Table 4.--Area of land and forest by county and Forest Survey Unit, Michigan, 1980

| County | All land[1] | Forest land[2] |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  | All forest | Non commercial[3] | Commercial[4] | Commercial forest as a percent of land area | All forest as a percent of land area |
|  | - - - - - - - - -Thousand acres- | - - - - - - - - |  |  | - - - -Percent- | - - - |
| EASTERN UPPER PENINSULA |  |  |  |  |  |  |
| Alger | 578.9 | 530.7 | 38.8 | 491.9 | 85 | 92 |
| Chippewa | 1,017.6 | 757.5 | 51.6 | 705.9 | 69 | 74 |
| Delta | 753.0 | 596.8 | 22.3 | 574.5 | 76 | 79 |
| Luce | 580.1 | 496.5 | 28.1 | 468.4 | 81 | 86 |
| Mackinac | 649.1 | 565.0 | 40.7 | 524.3 | 81 | 87 |
| Menominee | 664.3 | 496.2 | 2.8 | 493.4 | 74 | 75 |
| Schoolcraft | 756.0 | 588.9 | 45.7 | 543.2 | 72 | 78 |
| All counties | 4,999.0 | 4,031.6 | 230.0 | 3,801.6 | 76 | 81 |
| WESTERN UPPER PENINSULA |  |  |  |  |  |  |
| Baraga | 576.5 | 539.8 | 26.6 | 513.2 | 89 | 94 |
| Dickinson | 484.6 | 381.0 | 4.4 | 376.6 | 78 | 79 |
| Gogebic | 708.4 | 654.6 | 34.7 | 619.9 | 88 | 92 |
| Houghton | 650.9 | 533.7 | 20.0 | 513.7 | 79 | 82 |
| Iron | 749.5 | 664.7 | 10.7 | 654.0 | 87 | 89 |
| Keweenaw | 344.1 | 333.1 | 126.0 | 207.1 | 60 | 97 |
| Marquette | 1,170.4 | 1,026.9 | 56.5 | 970.4 | 83 | 88 |
| Ontonagon | 842.0 | 724.7 | 50.0 | 674.7 | 80 | 86 |
| All counties | 5,526.4 | 4,858.5 | 328.9 | 4,529.6 | 82 | 88 |
| NORTHERN LOWER PENINSULA |  |  |  |  |  |  |
| Alcona | 433.6 | 318.9 | 12.4 | 306.5 | 71 | 74 |
| Alpena | 361.3 | 222.6 | 4.9 | 217.7 | 60 | 62 |
| Antrim | 304.3 | 159.9 | 3.3 | 156.6 | 51 | 53 |
| Arenac | 235.2 | 94.4 | 1.7 | 92.7 | 39 | 40 |
| Bay | 286.2 | 20.1 | 2.3 | 17.8 | 6 | 7 |
| Benzie | 201.9 | 131.0 | 9.9 | 121.1 | 60 | 65 |
| Charlevoix | 265.1 | 139.1 | 0.5 | 138.6 | 52 | 52 |
| Cheboygan | 461.2 | 383.0 | 16.4 | 366.6 | 79 | 83 |
| Clare | 365.4 | 219.9 | 4.2 | 215.7 | 59 | 60 |
| Crawford | 359.3 | 304.8 | 31.9 | 272.9 | 76 | 85 |
| Emmet | 294.7 | 202.2 | 7.0 | 195.2 | 66 | 69 |
| Gladwin | 322.2 | 193.1 | 0.3 | 192.8 | 60 | 60 |
| Grand Traverse | 295.8 | 154.4 | 2.2 | 152.2 | 51 | 52 |
| Iosco | 347.9 | 231.9 | 7.3 | 224.6 | 65 | 67 |
| Isabella | 365.9 | 78.4 | -- | 78.4 | 21 | 21 |
| Kalkaska | 362.0 | 275.3 | 22.0 | 253.3 | 70 | 76 |
| Lake | 365.3 | 300.0 | 0.2 | 299.8 | 82 | 82 |
| Leelanau | 220.5 | 94.1 | 18.3 | 75.8 | 34 | 43 |
| Manistee | 353.9 | 225.7 | 0.2 | 225.5 | 64 | 64 |
| Mason | 313.4 | 156.0 | 8.0 | 148.0 | 47 | 50 |
| Mecosta | 358.4 | 125.2 | 2.5 | 122.7 | 34 | 35 |
| Midland | 332.7 | 149.8 | 2.3 | 147.5 | 44 | 45 |
| Missaukee | 361.3 | 212.5 | 8.1 | 204.4 | 57 | 59 |
| Montmorency | 355.2 | 302.3 | 0.3 | 302.0 | 85 | 85 |
| Newaygo | 543.7 | 316.3 | 6.3 | 310.0 | 57 | 58 |

(Table 4 continued on next page)

(Table 4 continued)

| County | All land[1] | Forest land[2] | | | Commercial forest as a percent of land area | All forest as a percent of land area |
|---|---|---|---|---|---|---|
| | | All forest | Non commercial[3] | Commercial[4] | | |
| | - - - - - - - - -Thousand acres- | - - - - - - - - | | | - - - -Percent- | - - - |
| NORTHERN LOWER PENINSULA | | | | | | |
| Oceana | 343.2 | 160.0 | 11.7 | 148.3 | 43 | 47 |
| Ogemaw | 365.7 | 235.3 | 15.8 | 219.5 | 60 | 64 |
| Osceola | 371.8 | 158.5 | 1.7 | 156.8 | 42 | 43 |
| Oscoda | 360.2 | 309.9 | 2.7 | 307.2 | 85 | 86 |
| Otsego | 337.5 | 262.9 | 2.1 | 260.8 | 77 | 78 |
| Presque Isle | 414.6 | 277.6 | 10.7 | 266.9 | 64 | 67 |
| Roscommon | 333.4 | 252.8 | 6.1 | 246.7 | 74 | 76 |
| Wexford | 357.9 | 261.7 | 11.4 | 250.3 | 70 | 73 |
| All counties | 11,350.7 | 6,929.6 | 234.7 | 6,694.9 | 59 | 61 |
| SOUTHERN LOWER PENINSULA | | | | | | |
| Allegan | 528.6 | 137.4 | -- | 137.4 | 26 | 26 |
| Barry | 354.7 | 119.9 | 8.7 | 111.2 | 31 | 34 |
| Berrien | 371.0 | 67.3 | 1.2 | 66.1 | 18 | 18 |
| Branch | 323.8 | 44.1 | -- | 44.1 | 14 | 14 |
| Calhoun | 453.8 | 76.5 | 0.5 | 76.0 | 17 | 17 |
| Cass | 314.0 | 54.0 | -- | 54.0 | 17 | 17 |
| Clinton | 366.0 | 31.0 | 0.5 | 30.5 | 8 | 8 |
| Eaton | 365.5 | 45.5 | -- | 45.5 | 12 | 12 |
| Genesee | 410.9 | 44.0 | -- | 44.0 | 11 | 11 |
| Gratiot | 361.9 | 27.4 | -- | 27.4 | 8 | 8 |
| Hillsdale | 384.3 | 45.6 | 0.6 | 45.0 | 12 | 12 |
| Huron | 524.1 | 57.3 | 1.3 | 56.0 | 11 | 11 |
| Ingham | 357.7 | 42.1 | -- | 42.1 | 12 | 12 |
| Ionia | 367.8 | 38.6 | 1.4 | 37.2 | 10 | 10 |
| Jackson | 446.8 | 87.4 | 4.0 | 83.4 | 19 | 20 |
| Kalamazoo | 359.5 | 73.4 | 6.8 | 66.6 | 19 | 20 |
| Kent | 548.5 | 123.6 | 1.0 | 122.6 | 22 | 23 |
| Lapeer | 420.9 | 83.6 | 2.5 | 81.1 | 19 | 20 |
| Lenawee | 481.9 | 48.2 | 0.5 | 47.7 | 10 | 10 |
| Livingston | 366.1 | 78.2 | 9.0 | 69.2 | 19 | 21 |
| Macomb | 307.3 | 46.2 | 1.2 | 45.0 | 15 | 15 |
| Monroe | 356.5 | 35.2 | 0.1 | 35.1 | 10 | 10 |
| Montcalm | 455.9 | 145.3 | -- | 145.3 | 32 | 32 |
| Muskegon | 320.9 | 165.8 | 1.2 | 164.6 | 51 | 52 |
| Oakland | 554.6 | 104.2 | 22.1 | 82.1 | 15 | 19 |
| Ottawa | 360.5 | 77.8 | 0.2 | 77.6 | 22 | 22 |
| Saginaw | 520.7 | 82.7 | -- | 82.7 | 16 | 16 |
| St. Clair | 469.6 | 89.0 | 1.1 | 87.9 | 19 | 19 |
| St. Joseph | 323.6 | 59.9 | -- | 59.9 | 19 | 19 |
| Sanilac | 615.0 | 50.2 | 0.1 | 50.1 | 8 | 8 |
| Shiawassee | 345.4 | 52.8 | -- | 52.8 | 15 | 15 |
| Tuscola | 521.5 | 83.7 | -- | 83.7 | 16 | 16 |
| Van Buren | 385.6 | 106.2 | 4.2 | 102.0 | 26 | 28 |
| Washtenaw | 454.7 | 82.8 | 10.8 | 72.0 | 16 | 18 |
| Wayne | 387.2 | 42.2 | 6.7 | 35.5 | 9 | 11 |
| All counties | 14,486.8 | 2,549.1 | 85.7 | 2,463.4 | 17 | 18 |
| All units | 36,362.9 | 18,368.8 | 879.3 | 17,489.5 | 48 | 51 |

[1] 1970 Bureau of the Census estimates.

[2] Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover; excludes land currently developed for nonforest use such as urban or heavily settled residential or resort area, city parks, orchards, improved roads, or improved pasture land. The minimum forest area classified was 1 acre. Roadside, streamside, and shelterbelt strips of timber with a crown width of at least 120 feet and unimproved roads and trails, streams, and clearings in forested areas if less than 120 feet in width were classified as forest.

[3] Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions, and productive public forest land withdrawn from commercial timber production through statute or administrative regulation or exclusive use for Christmas tree production.

[4] Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.

Table 5.--Area of commercial forest land by ownership class and site class, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| National Forest | 2,441.5 | -- | -- | 43.5 | 365.3 | 989.1 | 1,043.6 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 44.9 | -- | -- | 1.5 | 8.3 | 12.7 | 22.4 |
| Indian | 22.3 | -- | -- | -- | 1.7 | 14.5 | 6.1 |
| State | 3,571.3 | -- | 3.3 | 75.1 | 596.7 | 1,323.5 | 1,572.7 |
| County and municipal | 186.7 | -- | -- | 4.8 | 49.1 | 70.8 | 62.0 |
| Forest industry | 1,980.8 | -- | -- | 22.6 | 234.5 | 730.1 | 993.6 |
| Farmer | 3,097.7 | -- | -- | 119.7 | 848.0 | 1,236.5 | 893.5 |
| Misc. private-corp. | 1,510.5 | -- | -- | 42.2 | 265.7 | 595.6 | 607.0 |
| Misc. private-indiv. | 4,633.8 | -- | 1.6 | 151.9 | 1,124.3 | 1,906.4 | 1,449.6 |
| All owners | 17,489.5 | -- | 4.9 | 461.3 | 3,493.6 | 6,879.2 | 6,650.5 |

Table 6.--Area of commercial forest land by ownership class and stand-volume class, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Stand-volume class (board feet[1/]) | | |
|---|---|---|---|---|
| | | Less than 1,500 | 1,500 to 5,000 | 5,000+ |
| National Forest | 2,441.5 | 1,132.7 | 963.0 | 345.8 |
| Bureau of Land Mgmt. | -- | -- | -- | -- |
| Miscellaneous federal | 44.9 | 33.9 | 11.0 | -- |
| Indian | 22.3 | 4.7 | 12.7 | 4.9 |
| State | 3,571.3 | 1,804.3 | 1,320.4 | 446.6 |
| County and municipal | 186.7 | 86.3 | 77.1 | 23.3 |
| Forest industry | 1,980.8 | 561.4 | 878.9 | 540.5 |
| Farmer | 3,097.7 | 1,324.7 | 1,255.0 | 518.0 |
| Misc. private-corp. | 1,510.5 | 565.1 | 584.3 | 361.1 |
| Misc. private-indiv. | 4,633.8 | 2,012.7 | 1,859.2 | 761.9 |
| All owners | 17,489.5 | 7,525.8 | 6,961.6 | 3,002.1 |

[1/] International 1/4-inch rule.

Table 7.--Area of privately owned commercial forest land by ownership class, owner tenure, and size of owner, Michigan, 1980

(In thousand acres)

| Ownership class and owner tenure class | All sizes | Size of owner (acres) 1-4 | 5-10 | 11-20 | 21-50 | 51-100 | 101-500 | 501-2,500 | 2,501-5,000 | 5001+ |
|---|---|---|---|---|---|---|---|---|---|---|
| Forest Industry | | | | | | | | | | |
| 1-4 years | 372.4 | -- | -- | -- | 1.6 | -- | 1.6 | 6.4 | -- | 362.8 |
| 5-9 years | 115.8 | -- | -- | -- | 2.3 | -- | 1.6 | 4.8 | -- | 107.1 |
| 10-19 years | 441.2 | -- | -- | -- | -- | -- | -- | 3.1 | 4.9 | 433.2 |
| 20+ years | 1,051.4 | -- | 2.7 | -- | -- | 2.3 | 3.3 | 3.1 | 4.3 | 1,035.7 |
| All classes | 1,980.8 | -- | 2.7 | -- | 3.9 | 2.3 | 6.5 | 17.4 | 9.2 | 1,938.8 |
| Farmer | | | | | | | | | | |
| 1-4 years | 503.6 | 13.6 | 22.8 | 51.8 | 118.9 | 116.5 | 155.8 | 16.9 | 5.7 | 1.6 |
| 5-9 years | 530.7 | 3.5 | 46.1 | 38.6 | 136.8 | 141.8 | 141.2 | 21.3 | -- | 1.4 |
| 10-19 years | 766.9 | 6.4 | 43.3 | 67.8 | 166.7 | 187.7 | 249.5 | 37.6 | 3.8 | 4.1 |
| 20+ years | 1,296.5 | 13.4 | 52.2 | 105.6 | 254.1 | 319.5 | 453.8 | 60.2 | 5.6 | 32.1 |
| All classes | 3,097.7 | 36.9 | 164.4 | 263.8 | 676.5 | 765.5 | 1,000.3 | 136.0 | 15.1 | 39.2 |
| Misc. priv.-corporation | | | | | | | | | | |
| 1-4 years | 156.6 | 2.7 | 4.2 | 2.2 | 6.4 | 5.2 | 41.4 | 42.1 | 6.2 | 46.2 |
| 5-9 years | 203.1 | -- | 3.6 | 2.6 | 13.8 | 29.0 | 55.3 | 43.4 | 10.8 | 44.6 |
| 10-19 years | 345.2 | -- | 2.7 | 4.1 | 12.6 | 8.3 | 44.0 | 34.8 | 8.7 | 230.0 |
| 20+ years | 805.6 | -- | -- | -- | 19.2 | 47.8 | 65.0 | 90.3 | 8.6 | 574.7 |
| All classes | 1,510.5 | 2.7 | 10.5 | 8.9 | 52.0 | 90.3 | 205.7 | 210.6 | 34.3 | 895.5 |
| Misc. priv.-individual | | | | | | | | | | |
| 1-4 years | 1,177.4 | 47.2 | 83.6 | 116.2 | 316.3 | 224.9 | 275.0 | 87.6 | 6.2 | 20.4 |
| 5-9 years | 1,021.8 | 34.5 | 87.3 | 116.5 | 320.6 | 164.0 | 234.7 | 57.6 | 1.8 | 4.8 |
| 10-19 years | 1,034.2 | 23.9 | 32.0 | 61.6 | 271.9 | 223.8 | 319.5 | 87.1 | 9.4 | 5.0 |
| 20+ years | 1,400.4 | 34.8 | 55.0 | 117.6 | 379.8 | 278.0 | 383.2 | 130.3 | 1.6 | 20.1 |
| All classes | 4,633.8 | 140.4 | 257.9 | 411.9 | 1,288.6 | 890.7 | 1,212.4 | 362.6 | 19.0 | 50.3 |
| All private owners | | | | | | | | | | |
| 1-4 years | 2,210.0 | 63.5 | 110.6 | 170.2 | 443.2 | 346.6 | 473.8 | 153.0 | 18.1 | 431.0 |
| 5-9 years | 1,871.4 | 38.0 | 137.0 | 157.7 | 473.5 | 334.8 | 432.8 | 127.1 | 12.6 | 157.9 |
| 10-19 years | 2,587.5 | 30.3 | 78.0 | 133.5 | 451.2 | 419.8 | 613.0 | 162.6 | 26.8 | 672.3 |
| 20+ years | 4,553.9 | 48.2 | 109.9 | 223.2 | 653.1 | 647.6 | 905.3 | 283.9 | 20.1 | 1,662.6 |
| All classes | 11,222.8 | 180.0 | 435.5 | 684.6 | 2,021.0 | 1,748.8 | 2,424.9 | 726.6 | 77.6 | 2,923.8 |

Table 8.--Area of commercial forest land by forest type, stand-size class, and ownership class, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Jack pine | | | | | | | | | | | |
| Sawtimber | 163.8 | 2.4 | -- | 2.9 | -- | 93.6 | 4.8 | 4.8 | 7.0 | 14.9 | 33.4 |
| Poletimber | 454.9 | 204.1 | -- | 4.2 | -- | 162.8 | 4.2 | 5.9 | 8.0 | 10.9 | 54.8 |
| Sapling & seedling | 218.0 | 61.9 | -- | 1.8 | -- | 104.0 | 8.3 | 1.2 | 10.6 | -- | 30.2 |
| All stands | 836.7 | 268.4 | -- | 8.9 | -- | 360.4 | 17.3 | 11.9 | 25.6 | 25.8 | 118.4 |
| Red pine | | | | | | | | | | | |
| Sawtimber | 140.0 | 26.9 | -- | 1.9 | -- | 59.7 | 3.3 | 1.7 | 16.4 | 7.2 | 22.9 |
| Poletimber | 329.2 | 168.0 | -- | -- | -- | 70.8 | 4.7 | 3.1 | 34.9 | 16.9 | 30.8 |
| Sapling & seedling | 186.7 | 124.7 | -- | -- | -- | 30.4 | 1.7 | -- | 7.5 | 3.9 | 18.5 |
| All stands | 655.9 | 319.6 | -- | 1.9 | -- | 160.9 | 9.7 | 4.8 | 58.8 | 28.0 | 72.2 |
| White pine | | | | | | | | | | | |
| Sawtimber | 147.5 | 19.2 | -- | -- | -- | 37.3 | -- | 16.9 | 19.5 | 24.6 | 30.0 |
| Poletimber | 40.5 | 3.3 | -- | -- | -- | 13.3 | -- | 1.7 | 4.3 | 4.5 | 13.4 |
| Sapling & seedling | 26.1 | -- | -- | -- | -- | 17.3 | -- | -- | 3.9 | -- | 4.9 |
| All stands | 214.1 | 22.5 | -- | -- | -- | 67.9 | -- | 18.6 | 27.7 | 29.1 | 48.3 |
| Balsam fir | | | | | | | | | | | |
| Sawtimber | 143.0 | 27.1 | -- | 3.1 | -- | 21.2 | -- | 30.6 | 8.3 | 12.4 | 40.3 |
| Poletimber | 315.9 | 68.6 | -- | -- | -- | 61.5 | 1.7 | 52.5 | 25.5 | 37.7 | 68.4 |
| Sapling & seedling | 176.5 | 20.3 | -- | -- | -- | 35.5 | 1.6 | 52.2 | 13.3 | 18.0 | 35.6 |
| All stands | 635.4 | 116.0 | -- | 3.1 | -- | 118.2 | 3.3 | 135.3 | 47.1 | 68.1 | 144.3 |
| White spruce | | | | | | | | | | | |
| Sawtimber | 28.6 | -- | -- | -- | -- | 3.1 | -- | 5.3 | 6.1 | 9.6 | 4.5 |
| Poletimber | 44.7 | -- | -- | -- | -- | 9.8 | -- | 12.8 | 1.7 | 3.0 | 17.4 |
| Sapling & seedling | 26.8 | -- | -- | -- | -- | 9.8 | 2.5 | 2.8 | 2.3 | 1.5 | 7.9 |
| All stands | 100.1 | -- | -- | -- | -- | 22.7 | 2.5 | 20.9 | 10.1 | 14.1 | 29.8 |
| Black spruce | | | | | | | | | | | |
| Sawtimber | 13.7 | -- | -- | -- | -- | 7.7 | -- | 1.5 | -- | 1.2 | 3.3 |
| Poletimber | 261.2 | 130.3 | -- | -- | -- | 53.1 | 1.7 | 25.0 | 7.5 | 6.6 | 37.0 |
| Sapling & seedling | 245.7 | 32.0 | -- | -- | -- | 89.2 | 1.6 | 43.5 | 12.5 | 22.5 | 44.4 |
| All stands | 520.6 | 162.3 | -- | -- | -- | 150.0 | 3.3 | 70.0 | 20.0 | 30.3 | 84.7 |
| Northern white-cedar | | | | | | | | | | | |
| Sawtimber | 305.8 | 5.2 | -- | -- | -- | 75.8 | 3.2 | 74.0 | 29.4 | 55.3 | 62.9 |
| Poletimber | 640.6 | 57.8 | -- | -- | -- | 195.1 | 4.8 | 100.1 | 121.8 | 31.9 | 129.1 |
| Sapling & seedling | 227.2 | 5.3 | -- | -- | 1.6 | 52.8 | 2.8 | 31.3 | 61.1 | 16.7 | 55.6 |
| All stands | 1,173.6 | 68.3 | -- | -- | 1.6 | 323.7 | 10.8 | 205.4 | 212.3 | 103.9 | 247.6 |

(Table 8 continued on next page)

(Table 8 continued)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. Federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Tamarack | | | | | | | | | | | |
| Sawtimber | 12.6 | -- | -- | -- | -- | 2.3 | -- | -- | | 2.4 | 7.9 |
| Poletimber | 35.5 | -- | -- | -- | -- | 14.9 | -- | 9.8 | 5.3 | -- | 5.5 |
| Sapling & seedling | 66.7 | -- | -- | -- | -- | 27.5 | -- | 10.3 | 5.9 | 3.8 | 19.2 |
| All stands | 114.8 | -- | -- | -- | -- | 44.7 | -- | 20.1 | 11.2 | 6.2 | 32.6 |
| Oak-hickory | | | | | | | | | | | |
| Sawtimber | 684.0 | 42.2 | -- | -- | -- | 86.1 | 2.3 | 8.1 | 197.6 | 51.0 | 296.7 |
| Poletimber | 782.2 | 167.2 | -- | -- | -- | 183.0 | 11.0 | 4.9 | 121.5 | 48.3 | 246.3 |
| Sapling & seedling | 307.4 | 37.0 | -- | 10.8 | -- | 71.8 | 5.9 | -- | 45.0 | 19.4 | 117.5 |
| All stands | 1,773.6 | 246.4 | -- | 10.8 | -- | 340.9 | 19.2 | 13.0 | 364.1 | 118.7 | 660.5 |
| Elm-ash-soft maple | | | | | | | | | | | |
| Sawtimber | 453.5 | 15.9 | -- | 4.2 | 1.5 | 59.2 | 8.0 | 34.3 | 144.9 | 49.3 | 136.2 |
| Poletimber | 471.1 | 25.1 | -- | -- | -- | 65.6 | 8.4 | 42.3 | 159.4 | 33.8 | 136.5 |
| Sapling & seedling | 401.8 | -- | -- | -- | -- | 60.3 | 6.9 | 24.5 | 135.7 | 45.9 | 128.5 |
| All stands | 1,326.4 | 41.0 | -- | 4.2 | 1.5 | 185.1 | 23.3 | 101.1 | 440.0 | 129.0 | 401.2 |
| Maple-birch | | | | | | | | | | | |
| Sawtimber | 2,479.7 | 230.0 | -- | -- | 3.2 | 286.6 | 17.1 | 693.3 | 413.6 | 270.4 | 565.5 |
| Poletimber | 2,568.2 | 442.8 | -- | 1.6 | 9.3 | 380.9 | 38.9 | 306.5 | 482.3 | 218.1 | 687.8 |
| Sapling & seedling | 1,050.5 | 14.9 | -- | 3.4 | -- | 179.1 | 6.6 | 105.3 | 316.0 | 97.0 | 328.2 |
| All stands | 6,098.4 | 687.7 | -- | 5.0 | 12.5 | 846.6 | 62.6 | 1,105.1 | 1,211.9 | 585.5 | 1,581.5 |
| Aspen | | | | | | | | | | | |
| Sawtimber | 533.8 | 20.9 | -- | -- | -- | 116.1 | 5.5 | 25.3 | 127.9 | 69.9 | 168.2 |
| Poletimber | 1,504.5 | 263.3 | -- | 6.4 | 5.1 | 286.0 | 14.6 | 88.1 | 255.8 | 112.7 | 472.5 |
| Sapling & seedling | 1,368.3 | 168.0 | -- | 1.5 | 1.6 | 430.7 | 9.3 | 96.9 | 172.4 | 111.2 | 376.7 |
| All stands | 3,406.6 | 452.2 | -- | 7.9 | 6.7 | 832.8 | 29.4 | 210.3 | 556.1 | 293.8 | 1,017.4 |
| Paper birch | | | | | | | | | | | |
| Sawtimber | 35.2 | 1.9 | -- | -- | -- | 4.7 | -- | 12.7 | -- | 6.6 | 9.3 |
| Poletimber | 269.9 | 39.2 | -- | 1.5 | -- | 64.0 | -- | 36.3 | 40.8 | 38.0 | 50.1 |
| Sapling & seedling | 69.7 | -- | -- | -- | -- | 4.3 | 5.3 | 11.7 | 15.9 | 3.3 | 29.2 |
| All stands | 374.8 | 41.1 | -- | 1.5 | -- | 73.0 | 5.3 | 60.7 | 56.7 | 47.9 | 88.6 |
| Exotic | | | | | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 |
| Poletimber | 35.0 | -- | -- | -- | -- | -- | -- | -- | 13.2 | 2.2 | 19.6 |
| Sapling & seedling | 46.5 | -- | -- | -- | -- | -- | -- | 1.1 | 4.6 | 11.1 | 29.7 |
| All stands | 86.3 | -- | -- | -- | -- | -- | -- | 1.1 | 17.8 | 13.3 | 54.1 |
| Nonstocked | 172.2 | 16.0 | -- | 1.6 | -- | 44.4 | -- | 2.5 | 38.3 | 16.8 | 52.6 |
| All types | | | | | | | | | | | |
| Sawtimber | 5,146.0 | 391.7 | -- | 12.1 | 4.7 | 853.4 | 44.2 | 908.5 | 970.7 | 574.8 | 1,385.9 |
| Poletimber | 7,753.4 | 1,569.7 | -- | 13.7 | 14.4 | 1,560.8 | 90.0 | 689.0 | 1,282.0 | 564.6 | 1,969.2 |
| Sapling & seedling | 4,417.9 | 464.1 | -- | 17.5 | 3.2 | 1,112.7 | 52.5 | 380.8 | 806.7 | 354.3 | 1,226.1 |
| Nonstocked | 172.2 | 16.0 | -- | 1.6 | -- | 44.4 | -- | 2.5 | 38.3 | 16.8 | 52.6 |
| All stands | 17,489.5 | 2,441.5 | -- | 44.9 | 22.3 | 3,571.3 | 186.7 | 1,980.8 | 3,097.7 | 1,510.5 | 4,633.8 |

Table 9.--Area of commercial forest land by forest type and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| Forest type | All Units | Forest Survey Unit | | | |
|---|---|---|---|---|---|
| | | Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
| Jack pine | 836.7 | 229.1 | 88.3 | 506.7 | 12.6 |
| Red pine | 655.9 | 139.8 | 57.6 | 427.0 | 31.5 |
| White pine | 214.1 | 68.7 | 48.7 | 75.2 | 21.5 |
| Balsam fir | 635.4 | 217.4 | 366.6 | 51.4 | -- |
| White spruce | 100.1 | 30.1 | 40.6 | 21.9 | 7.5 |
| Black spruce | 520.6 | 283.1 | 209.5 | 28.0 | -- |
| Northern white-cedar | 1,173.6 | 594.9 | 210.2 | 355.5 | 13.0 |
| Tamarack | 114.8 | 43.8 | 36.0 | 30.6 | 4.4 |
| Oak-hickory | 1,773.6 | 19.3 | 22.6 | 1,068.1 | 663.6 |
| Elm-ash-soft maple | 1,326.4 | 191.8 | 169.7 | 416.3 | 548.6 |
| Maple-birch | 6,098.4 | 1,160.3 | 2,372.4 | 1,662.4 | 903.3 |
| Aspen | 3,406.6 | 671.4 | 733.3 | 1,817.5 | 184.4 |
| Paper birch | 374.8 | 110.5 | 143.8 | 113.9 | 6.6 |
| Exotic | 86.3 | 1.2 | 1.6 | 57.2 | 26.3 |
| Nonstocked | 172.2 | 40.2 | 28.7 | 63.2 | 40.1 |
| All types | 17,489.5 | 3,801.6 | 4,529.6 | 6,694.9 | 2,463.4 |

Table 10.--Area of commercial forest land by county, stand-size class, and Forest Survey Unit, Michigan, 1980

(In thousand acres)

EASTERN UPPER PENINSULA

| County | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Alger | 491.9 | 212.6 | 194.5 | 77.1 | 7.7 |
| Chippewa | 705.9 | 173.5 | 378.6 | 151.4 | 2.4 |
| Delta | 574.5 | 99.2 | 329.4 | 145.2 | 0.7 |
| Luce | 468.4 | 179.8 | 163.3 | 119.4 | 5.9 |
| Mackinac | 524.2 | 122.1 | 283.2 | 111.3 | 7.6 |
| Menonimee | 493.4 | 79.2 | 230.6 | 181.1 | 2.5 |
| Schoolcraft | 543.3 | 139.6 | 245.5 | 144.8 | 13.4 |
| All counties | 3,801.6 | 1,006.0 | 1,825.1 | 930.3 | 40.2 |
| WESTERN UPPER PENINSULA | | | | | |
| Baraga | 513.2 | 283.8 | 154.4 | 72.1 | 2.9 |
| Dickinson | 376.6 | 74.1 | 190.8 | 108.6 | 3.1 |
| Gogebic | 619.9 | 168.3 | 354.3 | 93.5 | 3.8 |
| Houghton | 513.7 | 212.5 | 233.8 | 61.7 | 5.7 |
| Iron | 654.0 | 208.9 | 309.1 | 133.7 | 2.3 |
| Keweenaw | 207.1 | 121.2 | 62.2 | 23.7 | -- |
| Marquette | 970.4 | 367.1 | 436.2 | 161.9 | 5.2 |
| Ontonagon | 674.7 | 211.7 | 363.7 | 93.6 | 5.7 |
| All counties | 4,529.6 | 1,647.6 | 2,104.5 | 748.8 | 28.7 |
| NORTHERN LOWER PENINSULA | | | | | |
| Alcona | 306.5 | 74.8 | 152.0 | 77.4 | 2.3 |
| Alepna | 217.7 | 55.7 | 85.3 | 68.4 | 8.3 |
| Antrim | 156.6 | 25.1 | 107.1 | 22.2 | 2.2 |
| Arenac | 92.7 | 16.2 | 46.5 | 30.0 | -- |
| Bay | 17.8 | 2.0 | 8.8 | 7.0 | -- |
| Benzie | 121.1 | 29.2 | 56.0 | 35.9 | -- |
| Charlevoix | 138.6 | 46.5 | 80.9 | 8.8 | 2.4 |
| Cheboygan | 366.6 | 74.7 | 207.2 | 82.5 | 2.2 |
| Clare | 215.7 | 50.0 | 77.5 | 88.2 | -- |
| Crawford | 272.9 | 35.8 | 136.5 | 100.6 | -- |
| Emmet | 195.2 | 54.1 | 114.2 | 26.9 | -- |
| Gladwin | 192.8 | 36.3 | 89.9 | 64.5 | 2.1 |
| Grand Traverse | 152.2 | 43.6 | 70.8 | 37.8 | -- |
| Iosco | 224.6 | 49.7 | 115.7 | 59.2 | -- |
| Isabella | 78.4 | 24.3 | 20.4 | 30.2 | 3.5 |
| Kalkaska | 253.3 | 39.6 | 129.8 | 76.2 | 7.7 |
| Lake | 299.8 | 67.4 | 162.8 | 69.6 | -- |
| Leelanau | 75.8 | 42.1 | 24.4 | 9.3 | -- |
| Manistee | 225.5 | 57.9 | 83.2 | 75.6 | 8.8 |
| Mason | 148.0 | 40.5 | 70.0 | 35.9 | 1.6 |
| Mecosta | 122.7 | 32.4 | 34.6 | 53.4 | 2.3 |
| Midland | 147.5 | 41.3 | 60.3 | 45.9 | -- |
| Missaukee | 204.4 | 39.7 | 79.2 | 85.5 | -- |
| Montmorency | 302.0 | 40.6 | 107.9 | 141.5 | 12.0 |

(Table 10 continued on next page)

(Table 10 continued)

NORTHERN LOWER PENINSULA

| County | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Newaygo | 310.0 | 86.6 | 126.1 | 97.3 | -- |
| Oceana | 148.3 | 44.3 | 64.7 | 35.4 | 3.9 |
| Ogemaw | 219.5 | 35.3 | 117.8 | 64.6 | 1.8 |
| Osceola | 156.8 | 66.6 | 39.6 | 50.6 | -- |
| Oscoda | 307.2 | 52.0 | 125.9 | 129.3 | -- |
| Otsego | 260.8 | 43.2 | 137.0 | 80.6 | -- |
| Presque Isle | 266.9 | 54.4 | 125.4 | 87.1 | -- |
| Roscommon | 246.7 | 58.3 | 137.6 | 50.8 | -- |
| Wexford | 250.3 | 48.5 | 142.0 | 57.7 | 2.1 |
| All counties | 6,694.9 | 1,508.7 | 3,137.1 | 1,985.9 | 63.2 |

SOUTHERN LOWER PENINSULA

| County | All stands | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
|---|---|---|---|---|---|
| Allegan | 137.4 | 57.0 | 41.8 | 38.6 | -- |
| Barry | 111.2 | 62.0 | 24.4 | 24.8 | -- |
| Berrien | 66.1 | 42.0 | 12.5 | 11.6 | -- |
| Branch | 44.1 | 23.5 | 11.2 | 9.4 | -- |
| Calhoun | 76.1 | 40.5 | 23.0 | 12.6 | -- |
| Cass | 54.0 | 24.6 | 20.6 | 8.8 | -- |
| Clinton | 30.5 | 10.7 | 8.4 | 11.4 | -- |
| Eaton | 45.5 | 15.5 | 18.9 | 11.1 | -- |
| Genesee | 44.0 | 12.3 | 11.7 | 20.0 | -- |
| Gratiot | 27.4 | 13.7 | 6.2 | 7.5 | -- |
| Hillsdale | 45.0 | 12.1 | 9.7 | 17.3 | 5.9 |
| Huron | 56.1 | 14.0 | 19.4 | 18.5 | 4.2 |
| Ingham | 42.1 | 27.0 | 6.6 | 8.5 | -- |
| Ionia | 37.2 | 15.4 | 4.4 | 17.4 | -- |
| Jackson | 83.4 | 41.8 | 20.7 | 20.9 | -- |
| Kalamazoo | 66.6 | 19.8 | 15.5 | 31.3 | -- |
| Kent | 122.6 | 26.8 | 52.1 | 43.7 | -- |
| Lapeer | 81.0 | 36.8 | 19.1 | 25.1 | -- |
| Lenawee | 47.7 | 20.1 | 10.1 | 15.5 | 2.0 |
| Livingston | 69.1 | 45.4 | 16.7 | 7.0 | -- |
| Macomb | 45.0 | 13.5 | -- | 31.5 | -- |
| Monroe | 35.1 | 17.6 | 5.1 | 10.4 | 2.0 |
| Montcalm | 145.3 | 36.9 | 67.1 | 36.6 | 4.7 |
| Muskegon | 164.6 | 62.7 | 49.8 | 46.2 | 5.9 |
| Oakland | 82.2 | 26.9 | 17.8 | 32.9 | 4.6 |
| Ottawa | 77.5 | 39.4 | 11.2 | 26.9 | -- |
| Saginaw | 82.7 | 19.3 | 21.9 | 41.5 | -- |
| St. Clair | 87.9 | 41.4 | 12.5 | 34.0 | -- |
| St. Joseph | 59.9 | 27.0 | 7.4 | 23.7 | 1.8 |
| Sanilac | 50.1 | 4.2 | 9.4 | 32.0 | 4.5 |
| Shiawassee | 52.8 | 25.5 | 17.4 | 9.9 | -- |
| Tuscola | 83.7 | 11.8 | 56.6 | 15.3 | -- |
| Van Buren | 102.0 | 30.5 | 35.5 | 36.0 | -- |
| Washtenaw | 72.0 | 41.6 | 17.8 | 8.1 | 4.5 |
| Wayne | 35.5 | 24.4 | 4.2 | 6.9 | -- |
| All counties | 2,463.4 | 983.7 | 686.7 | 752.9 | 40.1 |
| All units | 17,489.5 | 5,146.0 | 7,753.4 | 4,417.9 | 172.2 |

Table 11.--Area of commercial forest land by forest type, stand-size class, and site class, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Jack pine | | | | | | | |
| Sawtimber | 163.8 | -- | -- | -- | 15.6 | 52.3 | 95.9 |
| Poletimber | 454.9 | -- | -- | -- | 8.7 | 100.4 | 345.8 |
| Sapling & seedling | 218.0 | -- | -- | -- | -- | 22.9 | 195.1 |
| All stands | 836.7 | -- | -- | -- | 24.3 | 175.6 | 636.8 |
| Red pine | | | | | | | |
| Sawtimber | 140.0 | -- | -- | 6.6 | 55.3 | 64.6 | 13.5 |
| Poletimber | 329.2 | -- | -- | 48.4 | 137.9 | 118.7 | 24.2 |
| Sapling & seedling | 186.7 | -- | -- | 6.9 | 37.5 | 129.8 | 12.5 |
| All stands | 655.9 | -- | -- | 61.9 | 230.7 | 313.1 | 50.2 |
| White pine | | | | | | | |
| Sawtimber | 147.5 | -- | -- | 15.7 | 33.7 | 71.1 | 27.0 |
| Poletimber | 40.5 | -- | -- | -- | 9.9 | 22.7 | 7.9 |
| Sapling & seedling | 26.1 | -- | -- | 2.2 | 4.1 | 8.9 | 10.9 |
| All stands | 214.1 | -- | -- | 17.9 | 47.7 | 102.7 | 45.8 |
| Balsam fir | | | | | | | |
| Sawtimber | 143.0 | -- | 1.7 | 23.1 | 57.9 | 45.2 | 15.1 |
| Poletimber | 315.9 | -- | 3.2 | 55.3 | 178.0 | 65.9 | 13.5 |
| Sapling & seedling | 176.5 | -- | -- | 18.2 | 76.4 | 35.6 | 46.3 |
| All stands | 635.4 | -- | 4.9 | 96.6 | 312.3 | 146.7 | 74.9 |
| White spruce | | | | | | | |
| Sawtimber | 28.6 | -- | -- | -- | 4.6 | 17.1 | 6.9 |
| Poletimber | 44.7 | -- | -- | -- | 14.4 | 19.6 | 10.7 |
| Sapling & seedling | 26.8 | -- | -- | -- | 9.8 | 14.7 | 2.3 |
| All stands | 100.1 | -- | -- | -- | 28.8 | 51.4 | 19.9 |
| Black spruce | | | | | | | |
| Sawtimber | 13.7 | -- | -- | -- | -- | 2.9 | 10.8 |
| Poletimber | 261.2 | -- | -- | -- | 13.6 | 29.7 | 217.9 |
| Sapling & seedling | 245.7 | -- | -- | -- | 1.9 | 17.8 | 226.0 |
| All stands | 520.6 | -- | -- | -- | 15.5 | 50.4 | 454.7 |
| Northern white-cedar | | | | | | | |
| Sawtimber | 305.8 | -- | -- | -- | -- | 43.0 | 262.8 |
| Poletimber | 640.6 | -- | -- | -- | 6.9 | 54.3 | 579.4 |
| Sapling & seedling | 227.2 | -- | -- | -- | -- | 13.0 | 214.2 |
| All stands | 1,173.6 | -- | -- | -- | 6.9 | 110.3 | 1,056.4 |

(Table 11 continued on next page)

(Table 11 continued)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Tamarack | | | | | | | |
| Sawtimber | 12.6 | -- | -- | -- | -- | 6.5 | 6.1 |
| Poletimber | 35.5 | -- | -- | -- | 2.3 | 10.7 | 22.5 |
| Sapling & seedling | 66.7 | -- | -- | -- | -- | 9.8 | 56.9 |
| All stands | 114.8 | -- | -- | -- | 2.3 | 27.0 | 85.5 |
| Oak-hickory | | | | | | | |
| Sawtimber | 684.0 | -- | -- | 21.4 | 174.2 | 315.3 | 173.1 |
| Poletimber | 782.2 | -- | -- | -- | 112.9 | 387.3 | 282.0 |
| Sapling & seedling | 307.4 | -- | -- | -- | 26.3 | 136.5 | 144.6 |
| All stands | 1,773.6 | -- | -- | 21.4 | 313.4 | 839.1 | 599.7 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 453.5 | -- | -- | -- | 126.8 | 122.7 | 204.0 |
| Poletimber | 471.1 | -- | -- | -- | 86.6 | 101.5 | 283.0 |
| Sapling & seedling | 401.8 | -- | -- | -- | 26.0 | 115.3 | 260.5 |
| All stands | 1,326.4 | -- | -- | -- | 239.4 | 339.5 | 747.5 |
| Maple-birch | | | | | | | |
| Sawtimber | 2,479.7 | -- | -- | 59.0 | 418.9 | 1,169.2 | 832.6 |
| Poletimber | 2,568.2 | -- | -- | 54.0 | 405.1 | 1,354.0 | 755.1 |
| Sapling & seedling | 1,050.5 | -- | -- | 13.8 | 133.3 | 471.2 | 432.2 |
| All stands | 6,098.4 | -- | -- | 126.8 | 957.3 | 2,994.4 | 2,019.9 |
| Aspen | | | | | | | |
| Sawtimber | 533.8 | -- | -- | 34.3 | 223.7 | 205.3 | 70.5 |
| Poletimber | 1,504.5 | -- | -- | 26.7 | 575.6 | 711.9 | 190.3 |
| Sapling & seedling | 1,368.3 | -- | -- | 44.0 | 462.4 | 592.0 | 269.9 |
| All stands | 3,406.6 | -- | -- | 105.0 | 1,261.7 | 1,509.2 | 530.7 |
| Paper birch | | | | | | | |
| Sawtimber | 35.2 | -- | -- | 2.0 | -- | 6.9 | 26.3 |
| Poletimber | 269.9 | -- | -- | 21.5 | 4.9 | 120.1 | 123.4 |
| Sapling & seedling | 69.7 | -- | -- | -- | 1.5 | 13.4 | 54.8 |
| All stands | 374.8 | -- | -- | 23.5 | 6.4 | 140.4 | 204.5 |
| Exotic | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | 4.8 | -- |
| Poletimber | 35.0 | -- | -- | 3.5 | 22.0 | 4.7 | 4.8 |
| Sapling & seedling | 46.5 | -- | -- | 2.3 | 11.1 | 21.6 | 11.5 |
| All stands | 86.3 | -- | -- | 5.8 | 33.1 | 31.1 | 16.3 |
| Nonstocked | 172.2 | -- | -- | 2.4 | 13.8 | 48.3 | 107.7 |
| All types | | | | | | | |
| Sawtimber | 5,146.0 | -- | 1.7 | 162.1 | 1,110.7 | 2,126.9 | 1,744.6 |
| Poletimber | 7,753.4 | -- | 3.2 | 209.4 | 1,578.8 | 3,101.5 | 2,860.5 |
| Sapling & seedling | 4,417.9 | -- | -- | 87.4 | 790.3 | 1,602.5 | 1,937.7 |
| Nonstocked | 172.2 | -- | -- | 2.4 | 13.8 | 48.3 | 107.7 |
| All stands | 17,489.5 | -- | 4.9 | 461.3 | 3,493.6 | 6,879.2 | 6,650.5 |

## Table 12.--Area of commercial forest land by forest type and stand-age class, Michigan, 1980

(In thousand acres)

| Forest type | All ages | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 836.7 | 82.6 | 101.4 | 75.1 | 156.1 | 196.0 | 110.5 | 45.9 | 45.2 | 14.7 | 4.4 | 2.3 | 2.5 | -- |
| Red pine | 655.9 | 56.4 | 135.4 | 182.1 | 117.2 | 69.5 | 12.8 | 23.7 | 17.4 | 14.1 | 9.4 | 16.4 | 1.5 | -- |
| White pine | 214.1 | 7.3 | 12.2 | 17.8 | 5.0 | 18.5 | 15.6 | 33.7 | 26.9 | 24.5 | 22.2 | 13.0 | 12.7 | 4.7 |
| Balsam fir | 635.4 | 51.9 | 73.6 | 52.7 | 69.9 | 117.1 | 94.1 | 57.1 | 42.3 | 22.5 | 14.6 | 23.7 | 11.0 | 4.9 |
| White spruce | 100.1 | 7.0 | 18.6 | 1.2 | 19.8 | 14.0 | 11.6 | 3.3 | 4.8 | 8.0 | -- | 9.6 | -- | 2.2 |
| Black spruce | 520.6 | 58.7 | 67.3 | 129.8 | 72.5 | 50.4 | 51.9 | 35.5 | 17.2 | 3.2 | 7.6 | 13.4 | 7.3 | 5.8 |
| Northern white-cedar | 1,173.6 | 26.9 | 54.6 | 88.4 | 73.6 | 62.6 | 113.7 | 141.4 | 127.0 | 135.2 | 86.5 | 139.2 | 67.2 | 57.3 |
| Tamarack | 114.8 | 20.2 | 15.2 | 16.0 | 11.6 | 5.9 | 18.1 | 10.7 | 5.1 | 1.5 | 4.5 | 3.7 | -- | 2.3 |
| Oak-hickory | 1,773.6 | 162.7 | 135.0 | 20.9 | 100.9 | 194.0 | 291.8 | 204.7 | 190.2 | 157.0 | 93.9 | 166.9 | 44.3 | 11.3 |
| Elm-ash-soft maple | 1,326.4 | 169.2 | 166.5 | 98.0 | 117.0 | 124.9 | 138.8 | 103.4 | 103.4 | 87.8 | 53.1 | 102.5 | 45.9 | 15.9 |
| Maple-birch | 6,098.4 | 506.1 | 423.7 | 192.4 | 376.2 | 896.7 | 891.5 | 504.7 | 408.3 | 475.0 | 442.4 | 618.4 | 269.6 | 93.4 |
| Aspen | 3,406.6 | 708.0 | 576.5 | 149.6 | 358.4 | 516.2 | 481.3 | 238.0 | 158.0 | 95.0 | 66.8 | 50.1 | 8.7 | -- |
| Paper birch | 374.8 | 31.1 | 32.7 | 10.9 | 26.3 | 41.1 | 96.8 | 79.9 | 26.2 | 8.2 | 12.0 | 3.0 | 5.0 | 1.6 |
| Exotic | 86.3 | 11.4 | 27.5 | 28.8 | 9.4 | 2.2 | 7.0 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 172.2 | 98.8 | 40.3 | 10.3 | 8.4 | 5.7 | 5.1 | -- | -- | 3.6 | -- | -- | -- | -- |
| All types | 17,489.5 | 1,998.3 | 1,880.5 | 1,074.0 | 1,522.3 | 2,314.8 | 2,340.6 | 1,482.0 | 1,172.0 | 1,050.3 | 817.4 | 1,162.2 | 475.7 | 199.4 |

Table 13.--Area of commercial forest land by forest type, site-index class, and Forest Survey Unit, Michigan, 1980

(In thousand acres)

ALL UNITS

| Forest type | All classes | Site-index class (feet) 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 836.7 | -- | 11.8 | 123.1 | 255.0 | 270.4 | 128.8 | 28.2 | 19.4 | -- |
| Red pine | 655.9 | -- | -- | 2.6 | 146.4 | 214.3 | 161.3 | 92.6 | 38.7 | -- |
| White pine | 214.1 | -- | -- | 17.6 | 41.7 | 89.4 | 36.9 | 20.0 | 8.5 | -- |
| Balsam fir | 635.4 | 2.9 | 9.5 | 62.6 | 176.2 | 268.6 | 90.2 | 10.4 | 11.9 | 3.1 |
| White spruce | 100.1 | -- | 4.7 | 13.6 | 19.2 | 25.8 | 14.4 | 19.7 | 2.7 | -- |
| Black spruce | 520.6 | -- | 50.9 | 226.1 | 177.7 | 50.3 | 13.7 | 1.9 | -- | -- |
| Northern white-cedar | 1,173.6 | 74.7 | 534.1 | 365.8 | 129.4 | 29.5 | 33.2 | 6.9 | -- | -- |
| Tamarack | 114.8 | -- | 17.2 | 40.8 | 27.7 | 18.3 | 8.5 | -- | 2.3 | -- |
| Oak-hickory | 1,773.6 | -- | 2.3 | 65.7 | 310.4 | 463.5 | 456.9 | 303.6 | 130.7 | 40.5 |
| Elm-ash-soft maple | 1,326.4 | -- | 10.0 | 128.1 | 162.0 | 261.2 | 333.8 | 191.8 | 120.3 | 119.2 |
| Maple-birch | 6,098.4 | -- | 21.6 | 120.5 | 562.8 | 1,320.2 | 1,926.0 | 1,404.3 | 564.0 | 179.0 |
| Aspen | 3,406.6 | -- | 2.7 | 55.8 | 214.0 | 592.1 | 969.9 | 954.1 | 512.9 | 105.1 |
| Paper birch | 374.8 | -- | 1.4 | 19.2 | 38.5 | 147.1 | 124.9 | 37.3 | 6.4 | -- |
| Exotic | 86.3 | -- | -- | 4.2 | 22.5 | 20.6 | 28.3 | 9.6 | -- | 1.1 |
| Nonstocked | 172.2 | 1.7 | 4.6 | 17.1 | 60.0 | 54.1 | 14.9 | 15.6 | 4.2 | -- |
| All types | 17,489.5 | 79.3 | 670.8 | 1,262.8 | 2,343.5 | 3,825.4 | 4,341.7 | 3,096.0 | 1,422.0 | 448.0 |
| EASTERN UPPER PENINSULA | | | | | | | | | | |
| Jack pine | 229.1 | -- | 11.8 | 60.4 | 48.3 | 76.7 | 25.1 | 5.2 | 1.6 | -- |
| Red pine | 139.8 | -- | -- | -- | 33.5 | 58.6 | 46.0 | 1.7 | -- | -- |
| White pine | 68.7 | -- | -- | 11.2 | 21.5 | 26.5 | 4.8 | 3.0 | 1.7 | -- |
| Balsam fir | 217.4 | 1.5 | 3.0 | 15.0 | 67.0 | 97.3 | 29.0 | 3.1 | -- | 1.5 |
| White spruce | 30.1 | -- | -- | 6.0 | 7.2 | 2.8 | 11.1 | 3.0 | -- | -- |
| Black spruce | 283.1 | -- | 13.4 | 127.7 | 114.6 | 21.5 | 4.4 | 1.5 | -- | -- |
| Northern white-cedar | 594.9 | 43.0 | 303.3 | 161.6 | 60.1 | 14.3 | 8.0 | 4.6 | -- | -- |
| Tamarack | 43.8 | -- | 4.6 | 19.2 | 13.6 | 4.8 | 1.6 | -- | -- | -- |
| Oak-hickory | 19.3 | -- | -- | 1.5 | 0.4 | 4.6 | 6.6 | 6.2 | -- | -- |
| Elm-ash-soft maple | 191.8 | -- | 1.5 | 25.2 | 54.0 | 57.7 | 39.6 | 10.8 | 3.0 | -- |
| Maple-birch | 1,160.3 | -- | 12.3 | 32.1 | 136.9 | 319.2 | 428.7 | 186.6 | 38.1 | 6.4 |
| Aspen | 671.4 | -- | -- | 25.9 | 77.2 | 157.9 | 204.3 | 160.8 | 40.3 | 5.0 |
| Paper birch | 110.5 | -- | -- | 6.3 | 13.8 | 47.6 | 36.6 | 4.7 | 1.5 | -- |
| Exotic | 1.2 | -- | -- | -- | -- | -- | 1.2 | -- | -- | -- |
| Nonstocked | 40.2 | 1.7 | 0.7 | 3.2 | 13.6 | 14.3 | 3.6 | 3.1 | -- | -- |
| All types | 3,801.6 | 46.2 | 350.6 | 495.3 | 661.7 | 903.8 | 850.6 | 394.3 | 86.2 | 12.9 |
| WESTERN UPPER PENINSULA | | | | | | | | | | |
| Jack pine | 88.3 | -- | -- | 1.7 | 5.9 | 10.2 | 45.0 | 15.2 | 10.3 | -- |
| Red pine | 57.6 | -- | -- | -- | 19.3 | 13.6 | 6.8 | 17.9 | -- | -- |
| White pine | 48.7 | -- | -- | -- | 8.1 | 29.3 | 9.7 | 1.6 | -- | -- |
| Balsam fir | 366.6 | 1.4 | 6.5 | 44.8 | 92.0 | 146.4 | 57.0 | 5.0 | 11.9 | 1.6 |
| White spruce | 40.6 | -- | -- | 3.3 | 9.8 | 13.0 | 3.3 | 11.2 | -- | -- |
| Black spruce | 209.5 | -- | 35.6 | 88.5 | 55.5 | 25.1 | 4.4 | 0.4 | -- | -- |
| Northern white-cedar | 210.2 | 16.3 | 103.8 | 58.3 | 18.2 | 2.7 | 10.9 | -- | -- | -- |
| Tamarack | 36.0 | -- | -- | 12.9 | 14.1 | 5.2 | 3.8 | -- | -- | -- |
| Oak-hickory | 22.6 | -- | -- | 1.7 | 3.2 | 4.7 | 11.4 | 1.6 | -- | -- |
| Elm-ash-soft maple | 169.7 | -- | 3.0 | 39.2 | 41.0 | 35.2 | 35.5 | 14.2 | 1.6 | -- |
| Maple-birch | 2,372.4 | -- | 9.3 | 51.7 | 267.1 | 616.8 | 825.5 | 463.1 | 126.2 | 12.7 |
| Aspen | 733.3 | -- | -- | 5.3 | 31.9 | 127.4 | 217.3 | 232.0 | 101.2 | 18.2 |
| Paper birch | 143.8 | -- | 1.3 | 3.1 | 6.7 | 62.1 | 54.6 | 16.0 | -- | -- |
| Exotic | 1.6 | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- |
| Nonstocked | 28.7 | -- | 2.3 | 2.6 | 2.8 | 17.0 | 2.9 | 1.1 | -- | -- |
| All types | 4,529.6 | 17.7 | 161.8 | 313.1 | 575.6 | 1,110.3 | 1,288.1 | 779.3 | 251.2 | 32.5 |

(Table 13 continued on next page)

(Table 13 continued)

NORTHERN LOWER PENINSULA

| Forest type | All classes | Site-index class (feet) 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 506.7 | -- | -- | 60.8 | 200.7 | 183.5 | 46.4 | 7.8 | 7.5 | -- |
| Red pine | 427.0 | -- | -- | 2.6 | 90.9 | 139.2 | 108.3 | 66.3 | 19.7 | -- |
| White pine | 75.2 | -- | -- | 6.4 | 12.1 | 22.5 | 22.4 | 7.1 | 4.7 | -- |
| Balsam fir | 51.4 | -- | -- | 2.8 | 17.2 | 24.9 | 4.2 | 2.3 | -- | -- |
| White spruce | 21.9 | -- | 4.7 | 4.3 | 2.2 | 2.5 | -- | 5.5 | 2.7 | -- |
| Black spruce | 28.0 | -- | 1.9 | 9.9 | 7.6 | 3.7 | 4.9 | -- | -- | -- |
| Northern white-cedar | 355.5 | 15.4 | 120.4 | 142.6 | 51.1 | 12.3 | 11.4 | 2.3 | -- | -- |
| Tamarack | 30.6 | -- | 8.2 | 8.7 | -- | 8.3 | 3.1 | -- | 2.3 | -- |
| Oak-hickory | 1,068.1 | -- | 2.3 | 49.4 | 271.5 | 339.9 | 244.2 | 119.1 | 29.6 | 12.1 |
| Elm-ash-soft maple | 416.3 | -- | 5.5 | 39.6 | 48.5 | 97.1 | 120.2 | 68.8 | 13.8 | 22.8 |
| Maple-birch | 1,662.4 | -- | -- | 27.5 | 116.6 | 297.5 | 465.8 | 477.0 | 210.7 | 67.3 |
| Aspen | 1,817.5 | -- | 2.7 | 24.6 | 104.9 | 273.0 | 507.8 | 532.9 | 293.9 | 77.7 |
| Paper birch | 113.9 | -- | 0.1 | 9.8 | 18.0 | 34.1 | 33.7 | 13.3 | 4.9 | -- |
| Exotic | 57.2 | -- | -- | -- | 12.5 | 13.0 | 21.0 | 9.6 | -- | 1.1 |
| Nonstocked | 63.2 | -- | 1.6 | 11.3 | 23.4 | 12.7 | 6.6 | 7.6 | -- | -- |
| All types | 6,694.9 | 15.4 | 147.4 | 400.3 | 977.2 | 1,464.2 | 1,600.0 | 1,319.6 | 589.8 | 181.0 |

SOUTHERN LOWER PENINSULA

| Forest type | All classes | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 12.6 | -- | -- | 0.2 | 0.1 | -- | 12.3 | -- | -- | -- |
| Red pine | 31.5 | -- | -- | -- | 2.7 | 2.9 | 0.2 | 6.7 | 19.0 | -- |
| White pine | 21.5 | -- | -- | -- | -- | 11.1 | -- | 8.3 | 2.1 | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 7.5 | -- | -- | -- | -- | 7.5 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 13.0 | -- | 6.6 | 3.3 | -- | 0.2 | 2.9 | -- | -- | -- |
| Tamarack | 4.4 | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 663.6 | -- | -- | 13.1 | 35.3 | 114.3 | 194.7 | 176.7 | 101.1 | 28.4 |
| Elm-ash-soft maple | 548.6 | -- | -- | 24.1 | 18.5 | 71.2 | 138.5 | 98.0 | 101.9 | 96.4 |
| Maple-birch | 903.3 | -- | -- | 9.2 | 42.2 | 86.7 | 206.0 | 277.6 | 189.0 | 92.6 |
| Aspen | 184.4 | -- | -- | -- | -- | 33.8 | 40.5 | 28.4 | 77.5 | 4.2 |
| Paper birch | 6.6 | -- | -- | -- | -- | 3.3 | -- | 3.3 | -- | -- |
| Exotic | 26.3 | -- | -- | 4.2 | 10.0 | 6.0 | 6.1 | -- | -- | -- |
| Nonstocked | 40.1 | -- | -- | -- | 20.2 | 10.1 | 1.8 | 3.8 | 4.2 | -- |
| All types | 2,463.4 | -- | 11.0 | 54.1 | 129.0 | 347.1 | 603.0 | 602.8 | 494.8 | 221.6 |

Table 14.--Area of commercial forest land by forest type, stand-size class, and basal-area class, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 163.8 | -- | -- | 4.2 | 10.8 | 23.1 | 22.8 | 32.4 | 24.4 | 15.5 | 16.6 | 14.0 | -- | -- | -- |
| Poletimber | 454.9 | -- | 4.4 | 20.2 | 18.3 | 72.0 | 29.9 | 46.0 | 55.2 | 34.9 | 65.4 | 56.8 | 50.2 | -- | 1.6 |
| Sapling & seedling | 218.0 | 27.4 | 16.9 | 18.7 | 38.1 | 35.4 | 24.0 | 21.5 | 18.7 | 4.9 | 4.1 | -- | 8.3 | -- | -- |
| All stands | 836.7 | 27.4 | 21.3 | 43.1 | 67.2 | 130.5 | 76.7 | 99.9 | 98.3 | 55.3 | 86.1 | 70.8 | 58.5 | -- | 1.6 |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 140.0 | -- | 1.9 | -- | 7.8 | 7.9 | 1.4 | 10.5 | 17.7 | 9.1 | 9.0 | 19.4 | 34.5 | 15.8 | 5.0 |
| Poletimber | 329.2 | -- | -- | -- | 2.2 | 7.5 | 14.3 | 17.0 | 49.7 | 19.5 | 17.8 | 54.9 | 54.4 | 59.5 | 32.4 |
| Sapling & seedling | 186.7 | 37.0 | 9.6 | 23.6 | 17.5 | 6.3 | 46.7 | 18.3 | 14.0 | 7.8 | -- | 3.5 | 2.4 | -- | -- |
| All stands | 655.9 | 37.0 | 11.5 | 23.6 | 27.5 | 21.7 | 62.4 | 45.8 | 81.4 | 36.4 | 26.8 | 77.8 | 91.3 | 75.3 | 37.4 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 147.5 | -- | -- | 1.4 | 7.4 | 5.5 | 3.0 | 8.9 | 20.2 | 11.6 | 18.6 | 32.2 | 8.2 | 30.5 | -- |
| Poletimber | 40.5 | -- | -- | -- | -- | 4.8 | 3.7 | 6.9 | 5.9 | 4.0 | 1.7 | 10.2 | 3.3 | -- | -- |
| Sapling & seedling | 26.1 | 1.5 | 3.4 | 7.1 | 1.7 | 4.4 | 2.3 | 5.7 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 214.1 | 1.5 | 3.4 | 8.5 | 9.1 | 14.7 | 9.0 | 21.5 | 26.1 | 15.6 | 20.3 | 42.4 | 11.5 | 30.5 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | 143.0 | -- | -- | -- | -- | -- | 11.3 | 1.6 | -- | 12.7 | 22.6 | 45.8 | 40.1 | 2.8 | 6.1 |
| Poletimber | 315.9 | -- | -- | 1.7 | 2.9 | 10.4 | 3.8 | 33.3 | 35.5 | 19.0 | 37.6 | 73.1 | 53.3 | 32.7 | 12.6 |
| Sapling & seedling | 176.5 | 2.8 | 25.0 | 7.9 | 22.4 | 21.2 | 13.8 | 28.7 | 15.5 | 12.0 | 16.2 | 4.9 | 4.7 | 1.4 | -- |
| All stands | 635.4 | 2.8 | 25.0 | 9.6 | 25.3 | 31.6 | 28.9 | 63.6 | 51.0 | 43.7 | 76.4 | 123.8 | 98.1 | 36.9 | 18.7 |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | 28.6 | -- | -- | -- | 1.5 | 1.7 | -- | 1.7 | 2.0 | 1.5 | 2.5 | 7.0 | 4.8 | 2.9 | 3.0 |
| Poletimber | 44.7 | -- | -- | -- | -- | 1.7 | -- | 2.6 | 3.4 | 8.1 | 4.8 | 4.0 | 16.9 | 1.7 | 1.5 |
| Sapling & seedling | 26.8 | 2.3 | 7.9 | 1.6 | 3.8 | 1.7 | 1.6 | 2.7 | 2.5 | -- | -- | 2.7 | -- | -- | -- |
| All stands | 100.1 | 2.3 | 7.9 | 1.6 | 5.3 | 5.1 | 1.6 | 7.0 | 7.9 | 9.6 | 7.3 | 13.7 | 21.7 | 4.6 | 4.5 |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | 13.7 | -- | -- | -- | -- | -- | 1.8 | -- | 3.8 | 1.5 | -- | 1.7 | 4.9 | -- | -- |
| Poletimber | 261.2 | 1.5 | -- | 1.6 | 43.7 | 7.7 | 15.3 | 13.6 | 9.3 | 13.1 | 30.4 | 78.8 | 27.3 | 10.3 | 8.6 |
| Sapling & seedling | 245.7 | 16.4 | 43.9 | 17.9 | 28.2 | 39.2 | 15.7 | 32.6 | 14.0 | 6.4 | 15.6 | 10.6 | 5.2 | -- | -- |
| All stands | 520.6 | 17.9 | 43.9 | 19.5 | 71.9 | 46.9 | 32.8 | 46.2 | 27.1 | 21.0 | 46.0 | 91.1 | 37.4 | 10.3 | 8.6 |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | 305.8 | -- | -- | -- | 4.8 | 3.2 | 4.4 | 9.8 | 10.3 | -- | 18.0 | 70.7 | 58.0 | 64.6 | 62.0 |
| Poletimber | 640.6 | -- | -- | -- | 5.5 | 1.8 | 5.6 | 13.3 | 19.2 | 19.4 | 32.3 | 80.2 | 167.9 | 138.5 | 156.9 |
| Sapling & seedling | 227.2 | 9.9 | 13.3 | 5.0 | 9.3 | 14.9 | 7.2 | 21.5 | 26.0 | 11.9 | 16.3 | 25.9 | 38.4 | 26.0 | 1.6 |
| All stands | 1,173.6 | 9.9 | 13.3 | 5.0 | 19.6 | 19.9 | 17.2 | 44.6 | 55.5 | 31.3 | 66.6 | 176.8 | 264.3 | 229.1 | 220.5 |

(Table 14 continued on next page)

(Table 14 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 12.6 | -- | -- | 2.7 | 2.3 | 2.4 | -- | -- | 3.9 | -- | -- | -- | 1.3 | -- | -- |
| Poletimber | 35.5 | -- | -- | -- | 4.3 | 3.6 | 3.4 | 10.1 | 3.2 | 5.6 | 3.3 | 2.0 | -- | -- | -- |
| Sapling & seedling | 66.7 | 3.0 | 3.8 | 14.6 | 15.0 | 3.2 | 4.5 | 4.2 | 8.8 | 6.4 | 1.6 | -- | 1.6 | -- | -- |
| All stands | 114.8 | 3.0 | 3.8 | 17.3 | 21.6 | 9.2 | 7.9 | 14.3 | 15.9 | 12.0 | 4.9 | 2.0 | 2.9 | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 684.0 | 1.7 | -- | 7.5 | 14.3 | 34.8 | 60.1 | 71.0 | 94.2 | 83.5 | 72.0 | 127.9 | 99.0 | 18.0 | -- |
| Poletimber | 782.2 | -- | 1.1 | -- | 4.3 | 46.6 | 100.8 | 103.5 | 118.4 | 101.1 | 103.9 | 129.5 | 56.1 | 10.7 | 6.2 |
| Sapling & seedling | 307.4 | 38.1 | 47.6 | 31.1 | 58.1 | 65.2 | 29.8 | 30.0 | 1.2 | 1.2 | 3.5 | 1.6 | -- | -- | -- |
| All stands | 1,773.6 | 39.8 | 48.7 | 38.6 | 76.7 | 146.6 | 190.7 | 204.5 | 213.8 | 185.8 | 179.4 | 259.0 | 155.1 | 28.7 | 6.2 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 453.5 | -- | -- | 12.0 | 27.3 | 37.2 | 20.3 | 33.0 | 64.5 | 25.6 | 21.0 | 74.6 | 95.3 | 37.0 | 5.7 |
| Poletimber | 471.1 | -- | 7.2 | 14.0 | 27.8 | 45.9 | 13.4 | 46.3 | 64.6 | 20.7 | 86.0 | 54.4 | 55.5 | 31.4 | 3.9 |
| Sapling & seedling | 401.8 | 44.2 | 35.2 | 32.6 | 88.0 | 52.5 | 50.2 | 37.5 | 30.5 | 3.0 | 16.3 | 8.8 | 3.0 | -- | -- |
| All stands | 1,326.4 | 44.2 | 42.4 | 58.6 | 143.1 | 135.6 | 83.9 | 116.8 | 159.6 | 49.3 | 123.3 | 137.8 | 153.8 | 68.4 | 9.6 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 2,479.7 | -- | 4.2 | -- | 18.6 | 55.8 | 45.0 | 132.1 | 217.9 | 168.6 | 351.4 | 534.8 | 668.7 | 219.8 | 62.8 |
| Poletimber | 2,568.2 | -- | 3.6 | 13.5 | 36.4 | 53.2 | 62.6 | 162.1 | 232.2 | 200.5 | 340.7 | 601.1 | 643.0 | 200.5 | 18.8 |
| Sapling & seedling | 1,050.5 | 88.1 | 126.2 | 91.7 | 154.6 | 135.9 | 98.3 | 136.6 | 73.7 | 60.2 | 34.8 | 41.6 | 8.8 | -- | -- |
| All stands | 6,098.4 | 88.1 | 134.0 | 105.2 | 209.6 | 244.9 | 205.9 | 430.8 | 523.8 | 429.3 | 726.9 | 1,177.5 | 1,320.5 | 420.3 | 81.6 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 533.8 | -- | 2.6 | 3.8 | 17.6 | 44.6 | 19.4 | 46.8 | 62.7 | 41.8 | 61.3 | 62.3 | 103.8 | 43.2 | 23.9 |
| Poletimber | 1,504.5 | -- | 5.4 | 12.5 | 60.7 | 82.7 | 93.7 | 169.0 | 159.7 | 149.4 | 214.9 | 191.3 | 234.5 | 103.2 | 27.5 |
| Sapling & seedling | 1,368.3 | 157.8 | 164.9 | 177.0 | 210.1 | 237.4 | 114.7 | 132.8 | 58.8 | 23.0 | 50.3 | 26.8 | 14.7 | -- | -- |
| All stands | 3,406.6 | 157.8 | 172.9 | 193.3 | 288.4 | 364.7 | 227.8 | 348.6 | 281.2 | 214.2 | 326.5 | 280.4 | 353.0 | 146.4 | 51.4 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 35.2 | -- | -- | -- | 1.5 | -- | 2.2 | 3.1 | -- | 1.6 | 3.9 | 9.5 | 11.8 | -- | 1.6 |
| Poletimber | 269.9 | -- | -- | -- | 2.3 | 11.0 | 16.7 | 17.5 | 24.2 | 11.6 | 43.9 | 41.2 | 80.0 | 18.5 | 3.0 |
| Sapling & seedling | 69.7 | 5.5 | 7.2 | 7.1 | 7.0 | 12.4 | 6.3 | 8.8 | 3.0 | 4.8 | 4.3 | 3.3 | -- | -- | -- |
| All stands | 374.8 | 5.5 | 7.2 | 7.1 | 10.8 | 23.4 | 25.2 | 29.4 | 27.2 | 18.0 | 52.1 | 54.0 | 91.8 | 18.5 | 4.6 |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 | -- | -- | -- |
| Poletimber | 35.0 | -- | -- | -- | -- | -- | 3.5 | -- | 2.2 | 2.4 | 8.5 | 10.1 | 5.9 | 2.4 | -- |
| Sapling & seedling | 46.5 | 1.1 | 6.0 | 2.4 | 5.2 | 4.3 | -- | 6.8 | 14.6 | -- | 3.5 | -- | 2.6 | -- | -- |
| All stands | 86.3 | 1.1 | 6.0 | 2.4 | 5.2 | 4.3 | 3.5 | 6.8 | 16.8 | 2.4 | 12.0 | 14.9 | 8.5 | 2.4 | -- |
| Nonstocked | 172.2 | 109.6 | 50.2 | 4.0 | 2.6 | 2.7 | 0.4 | 2.2 | 0.5 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 5,146.0 | 1.7 | 8.7 | 31.6 | 113.9 | 216.2 | 191.7 | 350.9 | 521.6 | 373.0 | 596.9 | 1,004.7 | 1,130.4 | 434.6 | 170.1 |
| Poletimber | 7,753.4 | 1.5 | 21.7 | 63.5 | 208.4 | 348.9 | 366.7 | 641.2 | 782.7 | 609.3 | 991.2 | 1,387.6 | 1,448.3 | 609.4 | 273.0 |
| Sapling & seedling | 4,417.9 | 435.1 | 510.9 | 438.3 | 659.0 | 634.0 | 415.1 | 487.7 | 281.3 | 141.6 | 166.5 | 129.7 | 89.7 | 27.4 | 1.6 |
| Nonstocked | 172.2 | 109.6 | 50.2 | 4.0 | 2.6 | 2.7 | 0.4 | 2.2 | 0.5 | -- | -- | -- | -- | -- | -- |
| All stands | 17,489.5 | 547.9 | 591.5 | 537.4 | 983.9 | 1,201.8 | 973.9 | 1,482.0 | 1,586.1 | 1,123.9 | 1,754.6 | 2,522.0 | 2,668.4 | 1,071.4 | 444.7 |

### Table 15.--Area of commercial forest land by stocking class of growing-stock trees and stand-size class, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Less than 16.7 | 172.2 | -- | -- | -- | 172.2 |
| 16.7 to 60.9 | 2,050.7 | 401.3 | 751.9 | 897.5 | -- |
| 61.0 to 100.9 | 6,602.3 | 1,900.6 | 2,895.2 | 1,806.5 | -- |
| 101.0 to 133.9 | 7,125.0 | 2,382.9 | 3,416.6 | 1,325.5 | -- |
| 134.0+ | 1,539.3 | 461.2 | 689.7 | 388.4 | -- |
| All classes | 17,489.5 | 5,146.0 | 7,753.4 | 4,417.9 | 172.2 |

### Table 16.--Area of commercial forest land by stocking class based on selected stand components, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | Stocking classified in terms of | | | | |
|---|---|---|---|---|---|
| | All live trees | Growing stock trees | Desirable trees | Acceptable trees | Rough and rotten trees |
| 0-10 | 38.9 | 94.6 | 17,069.4 | 94.6 | 10,172.9 |
| 11-20 | 76.2 | 208.7 | 313.3 | 211.4 | 4,373.5 |
| 21-30 | 206.2 | 248.1 | 75.1 | 253.5 | 1,841.5 |
| 31-40 | 188.5 | 345.0 | 21.8 | 365.3 | 680.3 |
| 41-50 | 384.5 | 592.8 | 3.4 | 603.6 | 270.4 |
| 51-60 | 485.8 | 734.1 | 3.8 | 777.4 | 94.6 |
| 61-70 | 787.8 | 1,072.4 | -- | 1,097.7 | 31.5 |
| 71-80 | 777.1 | 1,342.8 | 2.7 | 1,410.2 | 9.7 |
| 81-90 | 1,430.7 | 1,942.7 | -- | 1,994.3 | 4.8 |
| 91-100 | 1,772.6 | 2,244.3 | -- | 2,400.9 | 1.5 |
| 101-110 | 2,091.8 | 2,489.8 | -- | 2,490.9 | 1.8 |
| 111-120 | 2,542.6 | 2,279.7 | -- | 2,220.8 | 1.2 |
| 121-130 | 2,534.4 | 1,894.8 | -- | 1,823.7 | 3.1 |
| 131-140 | 2,070.4 | 1,230.0 | -- | 1,064.6 | 2.7 |
| 141-150 | 1,434.1 | 576.4 | -- | 511.9 | -- |
| 151-160 | 643.3 | 193.3 | -- | 168.7 | -- |
| 161+ | 24.6 | -- | -- | -- | -- |
| Total | 17,489.5 | 17,489.5 | 17,489.5 | 17,489.5 | 17,489.5 |

### Table 17.--Area of noncommercial forest land by ownership class, Michigan, 1980

(In thousand acres)

| Ownership class | All areas | Productive-reserved areas | Unproductive areas |
|---|---|---|---|
| National Forest | 137.4 | 65.8[1] | 71.6 |
| Bureau of Land Management | -- | -- | -- |
| Indian | -- | -- | -- |
| Miscellaneous federal | 184.0 | 180.5 | 3.5 |
| State | 382.1 | 321.4 | 60.7 |
| County and municipal | 15.3 | 13.7 | 1.6 |
| Forest industry | 24.7 | -- | 24.7 |
| Farmer | 42.9 | 17.7 | 25.2 |
| Misc. private-corp. | 35.1 | 10.1 | 25.0 |
| Misc. private-indiv. | 57.8 | 12.9 | 44.9 |
| Total | 879.3 | 622.1 | 257.2 |

[1] Includes 42.6 thousand acres of productive-deferred areas.

## Table 18.--Area of noncommercial forest land by forest type, Michigan, 1980

(In thousand acres)

| Forest type | All areas | Productive-reserved areas[1] | Unproductive areas |
|---|---|---|---|
| Jack pine | 23.3 | 16.2 | 7.1 |
| Red pine | 13.5 | 11.6 | 1.9 |
| White pine | 4.8 | 3.2 | 1.6 |
| Balsam fir | 76.9 | 71.6 | 5.3 |
| White spruce | 13.2 | 10.7 | 2.5 |
| Black spruce | 78.0 | 18.2 | 59.8 |
| Northern white-cedar | 73.7 | 6.4 | 67.3 |
| Tamarack | 18.9 | 0.1 | 18.8 |
| Oak-hickory | 80.8 | 74.8 | 6.0 |
| Elm-ash-soft maple | 78.4 | 52.8 | 25.6 |
| Maple-birch | 191.2 | 185.4 | 5.8 |
| Aspen | 133.4 | 125.7 | 7.7 |
| Paper birch | 15.4 | 8.2 | 7.2 |
| Exotic | 33.8 | 33.8 | -- |
| Nonstocked | 44.0 | 3.4 | 40.6 |
| All types | 879.3 | 622.1 | 257.2 |

[1] Includes 42.6 thousand acres of productive-deferred areas.

## Table 19.--Area of nonforest land with trees by forest type and land use, Michigan 1980

(In thousand acres)

| Forest type | All uses | Land use | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cropland | Improved pasture | Wooded strips | Idle farmland | Marsh | Wind-breaks | Urban and other windbreaks | Wooded pasture |
| Jack pine | 12.4 | 4.7 | 4.1 | -- | -- | 1.2 | 2.4 | -- | -- |
| Red pine | 15.5 | -- | 2.3 | 13.2 | -- | -- | -- | -- | -- |
| White pine | 2.2 | -- | -- | -- | -- | 2.2 | -- | -- | -- |
| Balsam fir | 5.9 | 1.7 | -- | -- | -- | 4.2 | -- | -- | -- |
| White spruce | 4.5 | -- | 2.3 | -- | -- | -- | -- | -- | 2.2 |
| Black spruce | 23.6 | -- | -- | 1.8 | -- | 21.8 | -- | -- | -- |
| Northern white-cedar | 22.4 | -- | -- | 1.9 | -- | 20.5 | -- | -- | -- |
| Tamarack | 5.2 | -- | -- | -- | -- | 5.2 | -- | -- | -- |
| Oak-hickory | 97.2 | 31.2 | 22.8 | 41.2 | 2.0 | -- | -- | -- | -- |
| Elm-ash-soft maple | 243.5 | 18.5 | 2.4 | 95.9 | 6.7 | 100.6 | 12.1 | -- | 7.3 |
| Maple-birch | 139.7 | 25.3 | 25.2 | 60.5 | -- | 9.2 | 17.3 | -- | 2.2 |
| Aspen | 128.0 | 15.4 | 18.6 | 26.8 | 4.1 | 55.7 | 5.7 | -- | 1.7 |
| Paper birch | 19.2 | -- | 4.5 | -- | -- | 14.7 | -- | -- | -- |
| Exotic | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 719.3 | 96.8 | 82.2 | 241.3 | 12.8 | 235.3 | 37.5 | -- | 13.4 |

Table 20.--Number of all live trees on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 132,762 | 65,576 | 25,309 | 12,893 | 8,878 | 6,272 | 4,174 | 3,653 | 2,241 | 1,482 | 934 | 628 | 632 | 89 | 1 |
| Red pine | 300,454 | 67,337 | 89,657 | 83,970 | 37,168 | 11,754 | 5,176 | 2,201 | 1,659 | 887 | 404 | 174 | 67 | -- | -- |
| Jack pine | 344,197 | 111,576 | 86,840 | 74,856 | 45,517 | 18,556 | 4,670 | 1,631 | 403 | 136 | 10 | 2 | -- | -- | -- |
| White spruce | 130,353 | 48,330 | 31,476 | 22,814 | 11,650 | 8,451 | 3,982 | 2,151 | 908 | 403 | 113 | 48 | 27 | -- | -- |
| Black spruce | 362,257 | 159,419 | 111,594 | 65,346 | 19,898 | 4,622 | 981 | 213 | 89 | 15 | 80 | -- | -- | -- | -- |
| Balsam fir | 1,160,602 | 688,251 | 277,990 | 126,889 | 46,973 | 14,832 | 4,415 | 971 | 242 | 34 | -- | -- | 5 | -- | -- |
| Hemlock | 115,402 | 36,250 | 25,597 | 14,020 | 11,476 | 8,703 | 7,192 | 5,290 | 3,361 | 1,616 | 935 | 529 | 401 | 32 | -- |
| Tamarack | 108,909 | 48,664 | 36,229 | 15,720 | 5,100 | 2,258 | 606 | 215 | 92 | 18 | 2 | 5 | -- | -- | -- |
| Northern white-cedar | 1,053,884 | 411,720 | 301,535 | 188,082 | 87,790 | 37,914 | 15,546 | 6,645 | 2,667 | 1,089 | 450 | 246 | 180 | 18 | 2 |
| Other softwoods | 76,489 | 21,669 | 34,059 | 15,164 | 4,107 | 1,057 | 298 | 127 | 5 | -- | 3 | -- | -- | -- | -- |
| Total | 3,785,309 | 1,658,792 | 1,020,286 | 619,754 | 278,557 | 114,419 | 47,040 | 23,097 | 11,667 | 5,680 | 2,931 | 1,632 | 1,312 | 139 | 3 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 156,629 | 53,400 | 39,513 | 23,824 | 15,994 | 9,810 | 5,847 | 3,132 | 2,208 | 1,229 | 701 | 368 | 445 | 144 | 14 |
| Select red oaks | 263,355 | 113,425 | 33,242 | 35,734 | 29,196 | 21,965 | 13,058 | 7,442 | 4,333 | 2,424 | 1,189 | 639 | 609 | 96 | 3 |
| Other red oaks | 66,655 | 21,456 | 10,770 | 13,309 | 7,955 | 5,778 | 3,531 | 1,760 | 952 | 664 | 196 | 123 | 135 | 26 | -- |
| Hickory | 44,298 | 25,914 | 6,731 | 3,479 | 3,162 | 2,409 | 1,335 | 620 | 296 | 192 | 65 | 50 | 34 | 5 | 6 |
| Yellow birch | 186,395 | 80,763 | 40,675 | 24,134 | 15,265 | 9,579 | 5,688 | 4,166 | 2,641 | 1,500 | 823 | 499 | 522 | 127 | 13 |
| Hard maple | 1,831,922 | 1,057,645 | 398,967 | 178,980 | 93,641 | 48,055 | 23,552 | 13,652 | 8,579 | 4,582 | 2,219 | 906 | 966 | 166 | 12 |
| Soft maple | 1,376,829 | 722,139 | 309,266 | 167,006 | 90,552 | 44,325 | 21,308 | 10,974 | 5,515 | 2,718 | 1,400 | 682 | 727 | 168 | 49 |
| Beech | 130,431 | 77,380 | 18,335 | 12,531 | 7,046 | 4,735 | 3,313 | 2,909 | 1,824 | 1,178 | 572 | 297 | 288 | 23 | -- |
| Ash | 662,439 | 405,622 | 148,106 | 58,060 | 24,860 | 13,060 | 6,569 | 3,225 | 1,589 | 708 | 311 | 147 | 149 | 28 | 5 |
| Balsam poplar | 105,627 | 53,103 | 19,326 | 11,591 | 8,548 | 5,305 | 3,517 | 2,246 | 1,123 | 481 | 241 | 104 | 34 | 8 | -- |
| Cottonwood | 11,382 | 3,880 | 2,785 | 1,398 | 848 | 1,049 | 439 | 316 | 294 | 99 | 94 | 74 | 73 | 26 | 7 |
| Bigtooth aspen | 383,367 | 195,179 | 65,444 | 44,726 | 35,555 | 23,284 | 12,063 | 4,608 | 1,615 | 598 | 158 | 85 | 52 | -- | -- |
| Quaking aspen | 1,022,422 | 602,188 | 159,857 | 105,999 | 72,329 | 43,630 | 23,110 | 9,392 | 3,991 | 1,313 | 463 | 121 | 25 | 4 | -- |
| Basswood | 148,113 | 45,977 | 24,205 | 26,672 | 21,543 | 14,917 | 7,771 | 3,770 | 1,786 | 814 | 358 | 166 | 118 | 12 | 4 |
| Yellow-poplar | 2,549 | 1,341 | 117 | 317 | 250 | 107 | 101 | 128 | 76 | 22 | 61 | 19 | 10 | -- | -- |
| Black walnut | 3,172 | -- | 595 | 898 | 466 | 486 | 256 | 207 | 165 | 45 | 21 | 18 | 10 | 5 | -- |
| Black cherry | 241,563 | 147,497 | 39,041 | 25,171 | 15,339 | 7,658 | 3,793 | 1,844 | 691 | 287 | 139 | 82 | 16 | 5 | -- |
| Butternut | 3,608 | 2,253 | 703 | 239 | 219 | 83 | 33 | 48 | 10 | 7 | -- | 5 | 8 | -- | -- |
| Elm | 267,950 | 166,173 | 54,242 | 24,365 | 11,699 | 5,521 | 2,968 | 1,605 | 687 | 364 | 193 | 57 | 51 | 24 | 1 |
| Paper birch | 320,345 | 96,825 | 81,929 | 68,863 | 42,199 | 19,354 | 7,452 | 2,429 | 912 | 242 | 85 | 31 | 20 | 4 | -- |
| Other hardwoods | 109,245 | 72,837 | 21,692 | 8,346 | 2,753 | 1,750 | 699 | 484 | 266 | 98 | 115 | 51 | 111 | 38 | 5 |
| Noncommercial species | 439,533 | 346,803 | 68,704 | 16,883 | 4,951 | 1,598 | 375 | 161 | 21 | 11 | 21 | 5 | -- | -- | -- |
| Total | 7,777,829 | 4,291,800 | 1,544,245 | 852,525 | 504,370 | 284,458 | 146,778 | 75,118 | 39,574 | 19,576 | 9,425 | 4,529 | 4,403 | 909 | 119 |
| All species | 11,563,138 | 5,950,592 | 2,564,531 | 1,472,279 | 782,927 | 398,877 | 193,818 | 98,215 | 51,241 | 25,256 | 12,356 | 6,161 | 5,715 | 1,048 | 122 |

Table 21.--Number of growing-stock trees on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 128,417 | 64,839 | 25,023 | 11,559 | 8,209 | 5,735 | 3,716 | 3,524 | 2,158 | 1,447 | 909 | 615 | 596 | 86 | 1 |
| Red pine | 296,143 | 66,343 | 88,905 | 82,276 | 36,565 | 11,578 | 5,105 | 2,201 | 1,659 | 872 | 400 | 172 | 67 | -- | -- |
| Jack pine | 317,741 | 99,705 | 80,921 | 69,634 | 43,414 | 17,615 | 4,540 | 1,399 | 371 | 130 | 10 | 2 | -- | -- | -- |
| White spruce | 125,699 | 48,005 | 30,960 | 19,560 | 11,430 | 8,255 | 3,921 | 2,089 | 908 | 386 | 110 | 48 | 27 | -- | -- |
| Black spruce | 356,220 | 155,640 | 110,833 | 64,399 | 19,471 | 4,527 | 952 | 214 | 89 | 15 | 80 | -- | -- | -- | -- |
| Balsam fir | 1,134,246 | 672,184 | 272,965 | 123,791 | 45,595 | 14,349 | 4,220 | 880 | 233 | 24 | -- | -- | 5 | -- | -- |
| Hemlock | 105,041 | 34,923 | 24,582 | 11,324 | 9,818 | 7,218 | 6,131 | 4,758 | 3,073 | 1,481 | 855 | 467 | 381 | 30 | -- |
| Tamarack | 101,527 | 45,164 | 34,552 | 14,360 | 4,513 | 2,077 | 561 | 195 | 88 | 10 | 2 | 5 | -- | -- | -- |
| Northern white-cedar | 950,523 | 380,987 | 278,655 | 166,785 | 74,366 | 29,662 | 11,974 | 4,902 | 1,963 | 693 | 288 | 145 | 93 | 10 | -- |
| Other softwoods | 65,409 | 18,799 | 29,803 | 12,187 | 3,312 | 955 | 223 | 127 | -- | -- | 3 | -- | -- | -- | -- |
| Total | 3,580,966 | 1,586,589 | 977,199 | 575,875 | 256,693 | 101,971 | 41,343 | 20,289 | 10,542 | 5,058 | 2,657 | 1,454 | 1,169 | 126 | 1 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 145,013 | 50,112 | 35,681 | 21,581 | 15,218 | 9,279 | 5,445 | 2,925 | 2,115 | 1,161 | 668 | 322 | 382 | 114 | 10 |
| Select red oaks | 251,581 | 110,085 | 31,239 | 33,787 | 28,087 | 20,470 | 12,213 | 6,979 | 4,147 | 2,300 | 1,087 | 580 | 530 | 74 | 3 |
| Other red oaks | 58,712 | 18,763 | 9,741 | 11,140 | 6,932 | 5,292 | 3,248 | 1,620 | 906 | 631 | 188 | 113 | 119 | 19 | -- |
| Hickory | 44,000 | 25,915 | 6,731 | 3,430 | 3,162 | 2,289 | 1,260 | 596 | 285 | 184 | 65 | 44 | 28 | 5 | 6 |
| Yellow birch | 156,281 | 70,658 | 35,843 | 18,807 | 12,153 | 7,373 | 4,130 | 3,187 | 1,950 | 1,091 | 505 | 298 | 234 | 42 | 10 |
| Hard maple | 1,701,982 | 981,930 | 376,443 | 166,204 | 85,708 | 43,429 | 20,555 | 12,269 | 7,822 | 4,060 | 1,958 | 788 | 707 | 106 | 3 |
| Soft maple | 1,287,123 | 679,816 | 291,593 | 154,878 | 83,338 | 39,765 | 18,625 | 9,635 | 4,725 | 2,313 | 1,189 | 537 | 555 | 136 | 18 |
| Beech | 119,594 | 74,103 | 17,199 | 10,724 | 5,671 | 3,940 | 2,526 | 2,264 | 1,499 | 870 | 432 | 214 | 137 | 15 | -- |
| Ash | 616,326 | 380,755 | 136,158 | 52,912 | 22,528 | 12,217 | 6,073 | 2,978 | 1,478 | 648 | 284 | 137 | 131 | 26 | 1 |
| Balsam poplar | 98,830 | 50,057 | 18,008 | 10,873 | 7,998 | 4,902 | 3,171 | 1,968 | 1,029 | 454 | 233 | 99 | 30 | 8 | -- |
| Cottonwood | 11,195 | 3,881 | 2,785 | 1,278 | 847 | 997 | 439 | 316 | 294 | 94 | 94 | 67 | 73 | 26 | 4 |
| Bigtooth aspen | 354,851 | 182,221 | 59,817 | 40,431 | 33,107 | 22,177 | 11,032 | 4,086 | 1,271 | 510 | 123 | 44 | 32 | -- | -- |
| Quaking aspen | 936,021 | 566,480 | 142,859 | 92,234 | 64,651 | 38,039 | 19,798 | 7,733 | 2,910 | 930 | 310 | 60 | 13 | 4 | -- |
| Basswood | 138,799 | 43,017 | 22,962 | 24,413 | 20,451 | 14,246 | 7,229 | 3,516 | 1,661 | 770 | 291 | 128 | 100 | 11 | 4 |
| Yellow-poplar | 2,549 | 1,341 | 117 | 317 | 250 | 107 | 101 | 128 | 76 | 22 | 61 | 19 | 10 | -- | -- |
| Black walnut | 3,112 | -- | 595 | 898 | 466 | 460 | 227 | 207 | 165 | 45 | 21 | 18 | 10 | -- | -- |
| Black cherry | 206,340 | 135,767 | 28,750 | 17,651 | 12,709 | 5,957 | 2,939 | 1,568 | 544 | 255 | 123 | 64 | 11 | 2 | -- |
| Butternut | 3,456 | 2,251 | 703 | 239 | 119 | 46 | 33 | 48 | 10 | 7 | -- | -- | -- | -- | -- |
| Elm | 253,305 | 159,095 | 51,068 | 22,448 | 10,582 | 4,806 | 2,650 | 1,423 | 637 | 320 | 171 | 49 | 39 | 16 | 1 |
| Paper birch | 291,432 | 89,568 | 72,503 | 62,923 | 38,941 | 17,723 | 6,622 | 2,128 | 783 | 163 | 45 | 19 | 14 | -- | -- |
| Other hardwoods | 97,074 | 66,413 | 19,238 | 6,523 | 2,106 | 1,354 | 522 | 398 | 211 | 51 | 100 | 48 | 83 | 24 | 3 |
| Total | 6,777,576 | 3,692,228 | 1,360,033 | 753,691 | 455,024 | 254,868 | 128,838 | 65,972 | 34,518 | 16,879 | 7,948 | 3,648 | 3,238 | 628 | 63 |
| All species | 10,358,542 | 5,278,817 | 2,337,232 | 1,329,566 | 711,717 | 356,839 | 170,181 | 86,261 | 45,060 | 21,937 | 10,605 | 5,102 | 4,407 | 754 | 64 |

Table 22.--Number of short-log trees on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 525 | 279 | 145 | 47 | 30 | 6 | 6 | 4 | 8 | -- | -- |
| Red pine | 94 | 59 | 29 | -- | -- | 6 | -- | -- | -- | -- | -- |
| Jack pine | 595 | 462 | 57 | 58 | 11 | 7 | -- | -- | -- | -- | -- |
| White spruce | 193 | 135 | 24 | 21 | -- | 10 | 3 | -- | -- | -- | -- |
| Black spruce | 66 | 57 | 9 | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 331 | 174 | 130 | 17 | -- | 10 | -- | -- | -- | -- | -- |
| Hemlock | 1,211 | 622 | 256 | 157 | 65 | 47 | 28 | 22 | 13 | 1 | -- |
| Tamarack | 81 | 68 | 10 | -- | 3 | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 3,333 | 1,658 | 895 | 390 | 197 | 82 | 55 | 26 | 28 | 2 | -- |
| Other softwoods | 72 | 47 | 25 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 6,501 | 3,561 | 1,580 | 690 | 306 | 168 | 92 | 52 | 49 | 3 | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 453 | -- | 234 | 128 | 33 | -- | 19 | 7 | 26 | 6 | -- |
| Select red oaks | 850 | -- | 413 | 183 | 76 | 68 | 46 | 32 | 25 | 7 | -- |
| Other red oaks | 196 | -- | 108 | 38 | 22 | 13 | 2 | -- | 7 | 6 | -- |
| Hickory | 62 | -- | 24 | 13 | 11 | 8 | -- | 6 | -- | -- | -- |
| Yellow birch | 1,399 | -- | 545 | 288 | 233 | 97 | 102 | 43 | 62 | 29 | -- |
| Hard maple | 2,504 | -- | 1,188 | 507 | 315 | 204 | 113 | 45 | 109 | 21 | 2 |
| Soft maple | 1,897 | -- | 877 | 395 | 320 | 122 | 57 | 55 | 58 | 9 | 4 |
| Beech | 581 | -- | 170 | 168 | 54 | 57 | 39 | 37 | 49 | 7 | -- |
| Ash | 424 | -- | 236 | 101 | 33 | 25 | 6 | 10 | 11 | -- | 2 |
| Balsam poplar | 127 | -- | 96 | 8 | 11 | 7 | 5 | -- | -- | -- | -- |
| Cottonwood | 3 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | -- |
| Bigtooth aspen | 540 | -- | 278 | 138 | 69 | 30 | 13 | 7 | 5 | -- | -- |
| Quaking aspen | 1,481 | -- | 795 | 341 | 219 | 78 | 29 | 17 | 2 | -- | -- |
| Basswood | 344 | -- | 172 | 62 | 58 | 17 | 19 | 13 | 2 | 1 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 3 | -- | -- | -- | -- | -- | -- | -- | -- | 3 | -- |
| Black cherry | 431 | -- | 282 | 67 | 51 | 23 | 8 | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 300 | -- | 182 | 81 | 4 | 20 | 10 | -- | 3 | -- | -- |
| Paper birch | 582 | -- | 382 | 90 | 46 | 29 | 25 | 7 | 2 | 1 | -- |
| Other hardwoods | 111 | -- | 46 | 48 | 7 | 5 | -- | -- | -- | 3 | 2 |
| Total | 12,288 | -- | 6,028 | 2,656 | 1,562 | 803 | 493 | 282 | 361 | 93 | 10 |
| All species | 18,789 | 3,561 | 7,608 | 3,346 | 1,868 | 971 | 585 | 334 | 410 | 96 | 10 |

Table 23.--Net volume of growing stock on commercial forest land by species group, Michigan, 1966 and 1980

(In million cubic feet)

| Species group | 1966[1] | 1980 |
|---|---|---|
| SOFTWOODS | | |
| White pine | 384.6 | 543.6 |
| Red pine | 287.0 | 713.9 |
| Jack pine | 392.8 | 628.2 |
| White spruce | 272.5 | 396.7 |
| Black spruce | 257.0 | 343.5 |
| Balsam fir | 740.4 | 780.8 |
| Hemlock | 519.1 | 486.7 |
| Tamarack | 84.7 | 108.2 |
| Northern white-cedar | 1,056.9 | 1,297.9 |
| Other softwoods | 5.8 | 56.1 |
| Total | 4,000.8 | 5,355.6 |
| HARDWOODS | | |
| Select white oak | 440.3 | 561.6 |
| Select red oak | 740.9 | 1,166.2 |
| Other red oak | 416.5 | 291.0 |
| Hickory | 102.8 | 105.5 |
| Yellow birch | 510.6 | 466.6 |
| Hard maple | 2,275.3 | 2,748.8 |
| Soft maple | 1,266.7 | 2,252.8 |
| Beech | 409.5 | 337.9 |
| Ash | 502.2 | 677.2 |
| Balsam poplar | 174.4 | 240.7 |
| Cottonwood | 73.7 | 70.6 |
| Bigtooth aspen | 673.9 | 903.4 |
| Quaking aspen | 1,448.9 | 1,714.0 |
| Basswood | 463.5 | 668.3 |
| Yellow-poplar | 8.0 | 19.4 |
| Black walnut | 3.2 | 26.8 |
| Black cherry | 162.8 | 313.7 |
| Butternut | -- | 3.7 |
| Elm | 692.3 | 278.3 |
| Paper birch | 631.8 | 813.8 |
| Other hardwoods | 51.9 | 87.9 |
| Total | 11,049.2 | 13,748.2 |
| All species | 15,050.0 | 19,103.8 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 volumes because of changes in survey definitions and procedures.

Table 24.--Net volume of all live trees on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 560,093 | 25,794 | 40,539 | 52,556 | 54,779 | 77,221 | 67,902 | 62,448 | 51,446 | 44,909 | 65,386 | 16,638 | 475 |
| Red pine | 720,491 | 184,272 | 185,287 | 108,192 | 77,163 | 49,566 | 50,313 | 33,317 | 18,697 | 9,231 | 4,453 | -- | -- |
| Jack pine | 650,001 | 168,312 | 221,015 | 155,730 | 61,083 | 28,974 | 10,069 | 4,345 | 365 | 108 | -- | -- | -- |
| White spruce | 404,068 | 55,072 | 68,520 | 90,609 | 69,252 | 55,360 | 32,560 | 19,270 | 6,783 | 3,722 | 2,920 | -- | -- |
| Black spruce | 346,427 | 163,621 | 107,436 | 44,629 | 16,006 | 5,595 | 3,198 | 762 | 5,180 | -- | -- | -- | -- |
| Balsam fir | 794,962 | 302,866 | 248,720 | 143,844 | 67,886 | 21,596 | 7,792 | 1,514 | -- | -- | 744 | -- | -- |
| Hemlock | 524,783 | 25,206 | 45,134 | 59,319 | 77,255 | 86,151 | 77,983 | 51,424 | 39,868 | 27,012 | 30,787 | 4,558 | 86 |
| Tamarack | 112,877 | 41,034 | 29,543 | 24,310 | 10,017 | 4,607 | 2,662 | 317 | 68 | 319 | -- | -- | -- |
| Northern white-cedar | 1,454,692 | 419,634 | 377,810 | 265,909 | 166,975 | 100,490 | 56,160 | 28,879 | 15,957 | 10,214 | 10,377 | 1,975 | 312 |
| Other softwoods | 63,831 | 30,983 | 17,890 | 8,666 | 3,450 | 2,671 | 52 | -- | 119 | -- | -- | -- | -- |
| Total | 5,632,225 | 1,416,794 | 1,341,894 | 953,764 | 603,866 | 432,231 | 308,691 | 202,276 | 138,483 | 95,515 | 114,667 | 23,171 | 873 |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 594,196 | 66,867 | 89,964 | 91,532 | 81,483 | 61,412 | 59,494 | 42,108 | 31,014 | 19,207 | 31,175 | 16,715 | 3,225 |
| Select red oaks | 1,219,008 | 88,843 | 161,254 | 214,263 | 202,330 | 165,773 | 132,186 | 97,008 | 59,549 | 38,808 | 47,053 | 11,354 | 587 |
| Other red oaks | 311,800 | 31,060 | 45,095 | 55,425 | 53,994 | 39,196 | 29,766 | 26,519 | 9,963 | 7,355 | 10,512 | 2,915 | -- |
| Hickory | 108,551 | 8,177 | 17,430 | 24,613 | 20,797 | 14,277 | 8,816 | 6,691 | 2,885 | 2,325 | 1,680 | 396 | 464 |
| Yellow birch | 574,515 | 58,919 | 77,035 | 79,871 | 70,705 | 75,386 | 64,020 | 47,448 | 31,720 | 22,950 | 31,366 | 11,627 | 3,468 |
| Hard maple | 2,960,143 | 529,470 | 564,421 | 492,055 | 369,124 | 302,233 | 258,381 | 179,063 | 108,503 | 53,464 | 77,899 | 22,562 | 2,968 |
| Soft maple | 2,437,840 | 453,807 | 522,816 | 446,715 | 328,429 | 240,164 | 159,488 | 101,029 | 65,717 | 37,142 | 52,829 | 20,536 | 9,168 |
| Beech | 404,636 | 38,943 | 43,337 | 48,940 | 51,499 | 62,612 | 52,194 | 42,711 | 25,912 | 15,904 | 20,077 | 2,507 | -- |
| Ash | 714,225 | 155,726 | 139,413 | 130,297 | 101,034 | 70,132 | 48,245 | 28,017 | 16,147 | 8,767 | 12,287 | 3,429 | 731 |
| Balsam poplar | 252,236 | 21,518 | 36,453 | 39,387 | 42,746 | 40,877 | 30,595 | 17,611 | 11,837 | 6,734 | 3,130 | 1,348 | -- |
| Cottonwood | 71,861 | 3,502 | 4,451 | 9,397 | 6,817 | 7,237 | 10,182 | 4,044 | 5,386 | 5,393 | 8,050 | 5,204 | 2,198 |
| Bigtooth aspen | 955,512 | 122,681 | 210,333 | 245,224 | 192,317 | 102,581 | 45,931 | 22,057 | 7,241 | 4,097 | 3,050 | -- | -- |
| Quaking aspen | 1,887,212 | 290,235 | 426,547 | 440,874 | 351,412 | 199,153 | 107,063 | 45,038 | 19,434 | 5,408 | 1,583 | 465 | -- |
| Basswood | 698,091 | 77,926 | 130,199 | 155,313 | 122,743 | 85,142 | 54,780 | 33,190 | 16,928 | 9,269 | 9,255 | 1,704 | 1,642 |
| Yellow-poplar | 19,425 | 1,065 | 1,337 | 1,295 | 1,950 | 2,982 | 3,209 | 879 | 4,016 | 1,757 | 935 | -- | -- |
| Black walnut | 27,846 | 2,491 | 2,776 | 5,063 | 3,590 | 4,380 | 4,423 | 1,633 | 1,052 | 1,228 | 619 | 591 | -- |
| Black cherry | 366,824 | 64,689 | 89,910 | 74,701 | 57,428 | 39,940 | 19,225 | 10,126 | 5,691 | 3,675 | 926 | 513 | -- |
| Butternut | 4,844 | 639 | 1,002 | 892 | 495 | 955 | 180 | 170 | -- | 177 | 334 | -- | -- |
| Elm | 302,534 | 60,783 | 63,031 | 51,237 | 43,518 | 33,423 | 19,087 | 12,941 | 3,879 | 3,049 | 3,886 | 2,584 | 116 |
| Paper birch | 873,794 | 219,761 | 262,840 | 197,062 | 110,836 | 47,885 | 23,092 | 7,070 | 2,801 | 1,374 | 960 | 113 | -- |
| Other hardwoods | 105,271 | 19,624 | 15,390 | 16,702 | 9,665 | 10,221 | 7,484 | 2,826 | 5,240 | 2,959 | 8,823 | 5,226 | 1,111 |
| Noncommercial species | 79,629 | 37,878 | 22,110 | 11,518 | 4,081 | 2,416 | 348 | 338 | 738 | 202 | -- | -- | -- |
| Total | 14,969,993 | 2,354,604 | 2,927,144 | 2,832,376 | 2,226,993 | 1,608,377 | 1,138,189 | 728,517 | 440,653 | 251,244 | 326,429 | 109,789 | 25,678 |
| All species | 20,602,218 | 3,771,398 | 4,269,038 | 3,786,140 | 2,830,859 | 2,040,608 | 1,446,880 | 930,793 | 579,136 | 346,759 | 441,096 | 132,960 | 26,551 |

## Table 25.--Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods, Michigan, 1980

(In thousand cubic feet)

| Class of timber | All species | Softwoods | Hardwoods |
|---|---|---|---|
| LIVE TREES | | | |
| Growing-stock trees | | | |
| Sawtimber | | | |
| Saw log portion | 7,667,408 | 2,389,052 | 5,278,356 |
| Upper stem portion | 1,262,675 | 320,030 | 942,645 |
| Subtotal | 8,930,083 | 2,709,082 | 6,221,001 |
| Poletimber | 10,173,717 | 2,646,517 | 7,527,200 |
| Total | 19,103,800 | 5,355,599 | 13,748,201 |
| Cull trees | | | |
| Rough and rotten cull trees | | | |
| Sawtimber | 516,866 | 106,336 | 410,530 |
| Poletimber | 695,122 | 112,176 | 582,946 |
| Subtotal | 1,211,988 | 218,512 | 993,476 |
| Short-log trees | 286,430 | 58,114 | 228,316 |
| Total | 1,498,418 | 276,625 | 1,221,793 |
| TOTAL LIVE TREES | 20,602,218 | 5,632,225 | 14,969,993 |
| SALVABLE DEAD TREES | 627,545 | 224,256 | 403,289 |
| ALL CLASSES | 21,229,763 | 5,856,481 | 15,373,282 |

Table 26.--Net volume of growing stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species, Michigan, 1980

| Species | Total all live | Growing stock | Short-log cull | Rough and rotten cull | Sawtimber |
|---|---|---|---|---|---|
| | -Thousand cubic feet- | | | | Thousand board feet[1] |
| SOFTWOODS | | | | | |
| White pine | 560,093 | 543,535 | 4,499 | 12,059 | 2,606,707 |
| Red pine | 720,491 | 713,841 | 696 | 5,954 | 1,890,783 |
| Jack pine | 650,001 | 628,201 | 3,797 | 18,003 | 1,300,487 |
| Scotch pine | 55,617 | 49,638 | 227 | 5,752 | 65,036 |
| Austrian pine | 6,728 | 5,071 | 155 | 1,502 | 2,385 |
| White spruce | 404,068 | 396,698 | 1,592 | 5,778 | 1,395,518 |
| Norway spruce | 498 | 498 | -- | -- | -- |
| Engelmann spruce | 81 | 81 | -- | -- | -- |
| Black spruce | 346,427 | 343,499 | 360 | 2,568 | 364,731 |
| Balsam fir | 794,962 | 780,816 | 2,743 | 11,403 | 1,086,763 |
| Hemlock | 524,783 | 486,735 | 12,079 | 25,969 | 2,389,793 |
| Tamarack | 112,877 | 108,188 | 515 | 4,174 | 191,493 |
| Northern white cedar | 1,454,692 | 1,297,942 | 31,451 | 125,299 | 2,648,562 |
| Eastern redcedar | 907 | 856 | -- | 51 | 3,261 |
| Total | 5,632,225 | 5,355,599 | 58,114 | 218,512 | 13,945,519 |
| HARDWOODS | | | | | |
| White oak | 531,510 | 502,387 | 7,055 | 22,068 | 1,542,569 |
| Bur oak | 18,961 | 17,447 | 649 | 865 | 74,940 |
| Swamp white oak | 43,165 | 41,317 | 284 | 1,564 | 173,564 |
| Chestnut oak | 112 | -- | -- | 112 | -- |
| Chinkapin oak | 448 | 448 | -- | -- | -- |
| Northern red oak | 1,219,009 | 1,166,227 | 16,311 | 36,471 | 3,903,389 |
| Scarlet oak | 2,580 | 2,391 | -- | 189 | 3,888 |
| Northern pin oak | 66,164 | 63,521 | 807 | 1,836 | 197,118 |
| Pin oak | 1,580 | 1,580 | -- | -- | 4,228 |
| Black oak | 241,475 | 223,544 | 2,949 | 14,982 | 725,930 |
| Bitternut hickory | 36,180 | 35,035 | 251 | 894 | 96,731 |
| Shellbark hickory | 3,603 | 3,418 | -- | 185 | 11,290 |
| Shagbark hickory | 52,315 | 50,831 | 703 | 781 | 164,711 |
| Mockernut hickory | 3,128 | 3,128 | -- | -- | 11,066 |
| Pignut hickory | 13,324 | 13,057 | 202 | 65 | 47,773 |
| Yellow birch | 574,515 | 466,546 | 28,097 | 79,872 | 1,516,165 |
| Black maple | 904 | 699 | -- | 205 | 3,166 |
| Sugar maple | 2,959,238 | 2,748,073 | 53,501 | 157,664 | 6,994,696 |
| Red maple | 2,285,162 | 2,109,068 | 34,003 | 142,091 | 4,342,198 |
| Silver maple | 152,679 | 143,684 | 1,288 | 7,707 | 471,028 |
| Beech | 404,636 | 337,921 | 14,703 | 52,012 | 1,240,413 |
| White ash | 382,040 | 370,065 | 4,617 | 7,358 | 990,737 |
| Black ash | 263,535 | 243,469 | 1,503 | 18,563 | 342,237 |
| Green ash | 68,650 | 63,697 | 1,591 | 3,362 | 136,195 |
| Balsam poplar | 252,236 | 240,668 | 1,691 | 9,877 | 811,808 |
| Eastern cottonwood | 71,862 | 70,608 | 92 | 1,162 | 291,306 |
| Bigtooth aspen | 955,513 | 903,436 | 8,056 | 44,021 | 1,842,998 |
| Quaking aspen | 1,887,213 | 1,713,956 | 21,989 | 151,268 | 3,460,406 |
| Basswood | 698,092 | 668,337 | 6,136 | 23,619 | 1,772,951 |
| Hackberry | 679 | 679 | -- | -- | 2,391 |
| American elm | 279,846 | 257,874 | 4,689 | 17,283 | 604,467 |
| Slippery elm | 14,381 | 13,425 | -- | 956 | 19,598 |
| Rock elm | 8,306 | 6,955 | 135 | 1,216 | 8,891 |
| Paper birch | 873,794 | 813,842 | 8,451 | 51,501 | 910,295 |
| Chestnut | 296 | 110 | -- | 186 | -- |
| Black tupelo | 2,865 | 2,430 | -- | 435 | 4,357 |
| Sycamore | 13,416 | 13,228 | -- | 188 | 56,740 |
| Butternut | 4,844 | 3,662 | -- | 1,182 | 8,952 |
| Black walnut | 27,846 | 26,773 | 288 | 785 | 84,707 |
| Black cherry | 366,822 | 313,738 | 6,053 | 47,031 | 593,837 |
| Yellow-poplar | 19,425 | 19,425 | -- | -- | 87,069 |
| Boxelder | 6,850 | 4,981 | 336 | 1,533 | 3,676 |
| Ohio buckeye | 393 | 393 | -- | -- | 665 |
| Sweet birch | 104 | 104 | -- | -- | -- |
| River birch | 336 | 336 | -- | -- | 878 |
| Flowering dogwood | 696 | -- | -- | 696 | -- |
| Honeylocust | 1,518 | 1,425 | -- | 93 | -- |
| Osage orange | 329 | 329 | -- | -- | -- |
| Red mulberry | 694 | 97 | -- | 597 | -- |
| Black locust | 3,099 | 2,790 | -- | 309 | 4,328 |
| Black willow | 36,328 | 30,122 | 1,705 | 4,501 | 120,166 |
| Sassafras | 37,668 | 30,925 | 181 | 6,562 | 39,099 |
| Noncommercial species | 79,629 | -- | -- | 79,629 | -- |
| Total | 14,969,993 | 13,748,201 | 228,316 | 993,476 | 33,723,617 |
| All species | 20,602,218 | 19,103,800 | 286,430 | 1,211,988 | 47,669,136 |

[1] International ¼-inch rule.

## Table 27.--Net volume of noncommercial species on commercial forest land by individual species, Michigan, 1980

(In thousand cubic feet)

| Species | Cull volume |
|---|---|
| Striped maple | 1,771 |
| Mountain maple | 3,078 |
| Ailanthus | 540 |
| American hornbeam | 1,186 |
| Eastern hophornbeam | 56,959 |
| Eastern redbud | -- |
| Hawthorn | 3,801 |
| Apple | 5,669 |
| Pin cherry | 2,317 |
| Chokecherry | 2,288 |
| Mountain ash | 1,434 |
| Peachleaf willow | 586 |
| Diamond willow | -- |
| All species | 79,629 |

Table 28.--Net volume of growing stock on commercial forest land by species group and Forest Survey Unit, Michigan, 1980

(In thousand cubic feet)

| Species group | All Units | Forest Survey Unit | | | |
|---|---|---|---|---|---|
| | | Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
| SOFTWOODS | | | | | |
| White pine | 543,535 | 146,073 | 153,771 | 176,763 | 66,928 |
| Red pine | 713,841 | 138,860 | 73,688 | 452,495 | 48,798 |
| Jack pine | 628,201 | 174,266 | 104,739 | 335,918 | 13,278 |
| White spruce | 396,698 | 148,642 | 207,633 | 38,705 | 1,718 |
| Black spruce | 343,499 | 170,997 | 136,530 | 35,972 | -- |
| Balsam fir | 780,816 | 259,257 | 405,475 | 115,899 | 185 |
| Hemlock | 486,735 | 133,434 | 281,531 | 64,960 | 6,810 |
| Tamarack | 108,188 | 42,467 | 34,916 | 26,795 | 4,010 |
| Northern white-cedar | 1,297,942 | 532,848 | 330,049 | 431,116 | 3,929 |
| Other softwoods | 56,144 | 1,440 | 337 | 28,428 | 25,939 |
| Total | 5,355,599 | 1,748,284 | 1,728,669 | 1,707,051 | 171,595 |
| HARDWOODS | | | | | |
| Select white oaks | 561,599 | 358 | 769 | 251,160 | 309,312 |
| Select red oaks | 1,166,227 | 21,707 | 85,076 | 721,458 | 337,986 |
| Other red oaks | 291,036 | -- | -- | 180,189 | 110,847 |
| Hickory | 105,470 | -- | -- | 1,838 | 103,632 |
| Yellow birch | 466,546 | 99,743 | 321,572 | 37,604 | 7,627 |
| Hard maple | 2,748,772 | 536,418 | 1,404,710 | 692,984 | 114,660 |
| Soft maple | 2,252,752 | 477,453 | 628,509 | 748,355 | 398,435 |
| Beech | 337,921 | 168,298 | 488 | 121,689 | 47,446 |
| Ash | 677,231 | 66,641 | 130,790 | 251,892 | 227,908 |
| Balsam poplar | 240,668 | 89,733 | 42,799 | 98,083 | 10,053 |
| Cottonwood | 70,608 | 368 | 73 | 10,261 | 59,906 |
| Bigtooth aspen | 903,436 | 66,570 | 104,484 | 653,639 | 78,743 |
| Quaking aspen | 1,713,956 | 363,836 | 643,017 | 630,943 | 76,160 |
| Basswood | 668,337 | 50,367 | 209,228 | 325,173 | 83,569 |
| Yellow-poplar | 19,425 | -- | -- | -- | 19,425 |
| Black walnut | 26,773 | -- | -- | 200 | 26,573 |
| Black cherry | 313,738 | 49,645 | 53,658 | 94,087 | 116,348 |
| Butternut | 3,662 | -- | -- | 278 | 3,384 |
| Elm | 278,253 | 41,158 | 148,178 | 30,117 | 58,800 |
| Paper birch | 813,842 | 253,926 | 282,834 | 256,960 | 20,122 |
| Other hardwoods | 87,949 | 239 | 177 | 10,705 | 76,828 |
| Total | 13,748,201 | 2,286,460 | 4,056,362 | 5,117,615 | 2,287,764 |
| All species | 19,103,800 | 4,034,744 | 5,785,031 | 6,824,666 | 2,459,359 |

## Table 29.--Net volume of sawtimber on commercial forest land by species group and Forest Survey Unit, Michigan, 1980

(In thousand board feet)[1]

| Species group | All Units | Forest Survey Unit<br>Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| White pine | 2,606,707 | 736,589 | 780,033 | 811,402 | 278,683 |
| Red pine | 1,890,783 | 447,746 | 279,874 | 1,053,736 | 109,427 |
| Jack pine | 1,300,487 | 309,368 | 276,692 | 684,828 | 29,599 |
| White spruce | 1,395,518 | 527,783 | 745,345 | 121,852 | 538 |
| Black spruce | 364,731 | 169,698 | 153,343 | 41,690 | -- |
| Balsam fir | 1,086,763 | 323,226 | 610,899 | 151,930 | 708 |
| Hemlock | 2,389,793 | 661,391 | 1,444,202 | 252,871 | 31,329 |
| Tamarack | 191,493 | 66,942 | 61,261 | 56,260 | 7,030 |
| Northern white-cedar | 2,648,562 | 996,280 | 994,377 | 653,206 | 4,699 |
| Other softwoods | 70,682 | 1,602 | 589 | 11,647 | 56,844 |
| Total | 13,945,519 | 4,240,625 | 5,346,615 | 3,839,422 | 518,857 |
| HARDWOODS | | | | | |
| Select white oaks | 1,791,072 | 637 | 3,693 | 572,193 | 1,214,549 |
| Select red oaks | 3,903,389 | 65,731 | 298,531 | 2,159,690 | 1,379,437 |
| Other red oaks | 931,164 | -- | -- | 488,102 | 443,062 |
| Hickory | 331,572 | -- | -- | 5,588 | 325,984 |
| Yellow birch | 1,516,165 | 367,659 | 1,049,376 | 77,578 | 21,552 |
| Hard maple | 6,997,862 | 1,366,336 | 4,009,886 | 1,188,575 | 433,065 |
| Soft maple | 4,813,225 | 947,043 | 1,168,709 | 1,450,072 | 1,247,401 |
| Beech | 1,240,413 | 653,154 | 821 | 389,470 | 196,968 |
| Ash | 1,469,167 | 88,096 | 278,324 | 487,434 | 615,313 |
| Balsam poplar | 811,808 | 278,417 | 153,205 | 353,766 | 26,420 |
| Cottonwood | 291,306 | 1,936 | 371 | 42,830 | 246,169 |
| Bigtooth aspen | 1,842,998 | 112,159 | 242,428 | 1,339,410 | 149,001 |
| Quaking aspen | 3,460,406 | 638,290 | 1,360,347 | 1,366,066 | 95,703 |
| Basswood | 1,772,955 | 132,115 | 505,144 | 834,836 | 300,860 |
| Yellow-poplar | 87,069 | - | -- | -- | 87,069 |
| Black walnut | 84,707 | -- | -- | -- | 84,707 |
| Black cherry | 593,837 | 91,220 | 55,406 | 172,403 | 274,808 |
| Butternut | 8,952 | -- | -- | 1,427 | 7,525 |
| Elm | 632,956 | 124,011 | 396,325 | 44,130 | 68,490 |
| Paper birch | 910,295 | 287,113 | 376,599 | 233,758 | 12,825 |
| Other hardwoods | 232,299 | 665 | 432 | 35,432 | 195,770 |
| Total | 33,723,617 | 5,154,582 | 9,899,597 | 11,242,760 | 7,426,678 |
| All species | 47,669,136 | 9,395,207 | 15,246,212 | 15,082,182 | 7,945,535 |

[1] International 1/4-inch rule.

Table 30.--Net volume of growing stock on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| White pine | 543,535 | 23,688 | 38,480 | 49,740 | 51,529 | 75,803 | 66,833 | 61,706 | 50,733 | 44,569 | 63,782 | 16,197 | 475 |
| Red pine | 713,841 | 181,571 | 183,334 | 107,177 | 76,587 | 49,565 | 50,314 | 33,060 | 18,617 | 9,163 | 4,453 | -- | -- |
| Jack pine | 628,201 | 161,131 | 214,979 | 151,117 | 60,108 | 26,655 | 9,580 | 4,158 | 365 | 108 | -- | -- | -- |
| White spruce | 396,698 | 51,265 | 67,840 | 89,604 | 68,753 | 54,405 | 32,559 | 18,942 | 6,688 | 3,722 | 2,920 | -- | -- |
| Black spruce | 343,499 | 162,554 | 106,254 | 44,180 | 15,775 | 5,595 | 3,199 | 762 | 5,180 | -- | -- | -- | -- |
| Balsam fir | 780,816 | 298,257 | 244,577 | 141,120 | 66,420 | 20,806 | 7,680 | 1,212 | -- | -- | 744 | -- | -- |
| Hemlock | 486,735 | 21,975 | 40,360 | 52,226 | 70,607 | 81,244 | 73,999 | 48,787 | 37,871 | 25,444 | 29,831 | 4,305 | 86 |
| Tamarack | 108,188 | 39,079 | 28,198 | 23,517 | 9,761 | 4,366 | 2,601 | 278 | 68 | 320 | -- | -- | -- |
| Northern white-cedar | 1,297,942 | 393,828 | 346,857 | 232,620 | 144,362 | 84,872 | 47,112 | 21,617 | 11,973 | 7,157 | 6,408 | 1,136 | -- |
| Other softwoods | 56,144 | 26,612 | 15,677 | 8,159 | 2,906 | 2,671 | -- | -- | 119 | -- | -- | -- | -- |
| Total | 5,355,599 | 1,359,960 | 1,286,556 | 899,460 | 566,808 | 405,982 | 293,877 | 190,522 | 131,614 | 90,483 | 108,138 | 21,638 | 561 |
| HARDWOODS | | | | | | | | | | | | | |
| Select white oaks | 561,599 | 62,124 | 86,854 | 87,544 | 77,328 | 58,380 | 57,757 | 40,455 | 29,584 | 17,452 | 27,804 | 13,914 | 2,403 |
| Select red oaks | 1,166,227 | 85,143 | 156,629 | 204,332 | 193,432 | 158,695 | 128,701 | 93,810 | 56,135 | 36,308 | 43,073 | 9,382 | 587 |
| Other red oaks | 291,036 | 26,836 | 40,386 | 52,047 | 51,101 | 37,246 | 28,913 | 25,737 | 9,748 | 6,985 | 9,652 | 2,385 | -- |
| Hickory | 105,470 | 8,016 | 17,430 | 23,692 | 20,032 | 13,929 | 8,566 | 6,489 | 2,885 | 2,076 | 1,495 | 396 | 464 |
| Yellow birch | 466,546 | 52,657 | 67,576 | 68,527 | 57,294 | 63,422 | 52,118 | 38,612 | 22,929 | 16,500 | 18,547 | 5,300 | 3,064 |
| Hard maple | 2,748,772 | 502,732 | 530,603 | 459,286 | 335,868 | 281,621 | 243,518 | 165,461 | 99,710 | 48,778 | 63,805 | 15,903 | 1,487 |
| Soft maple | 2,252,752 | 429,805 | 493,406 | 414,115 | 301,108 | 221,054 | 144,524 | 91,909 | 59,153 | 32,010 | 44,491 | 17,474 | 3,703 |
| Beech | 337,921 | 35,378 | 37,685 | 43,271 | 42,456 | 52,269 | 45,644 | 34,208 | 21,231 | 12,516 | 11,365 | 1,898 | -- |
| Ash | 677,231 | 146,630 | 131,018 | 125,333 | 96,186 | 66,853 | 46,582 | 26,584 | 15,316 | 8,198 | 11,147 | 3,152 | 232 |
| Balsam poplar | 240,668 | 20,722 | 35,160 | 37,959 | 40,179 | 38,331 | 29,023 | 16,944 | 11,594 | 6,524 | 2,884 | 1,348 | -- |
| Cottonwood | 70,608 | 3,150 | 4,451 | 9,201 | 6,817 | 7,238 | 10,180 | 3,908 | 5,386 | 5,164 | 8,050 | 5,204 | 1,859 |
| Bigtooth aspen | 903,436 | 114,004 | 200,945 | 239,113 | 182,635 | 95,937 | 39,974 | 20,035 | 6,173 | 2,490 | 2,130 | -- | -- |
| Quaking aspen | 1,713,956 | 263,758 | 397,878 | 408,671 | 321,016 | 177,489 | 88,523 | 36,677 | 15,041 | 3,491 | 947 | 465 | -- |
| Basswood | 668,337 | 73,299 | 125,989 | 151,210 | 117,253 | 81,734 | 52,619 | 32,174 | 14,888 | 7,831 | 8,270 | 1,428 | 1,642 |
| Yellow-poplar | 19,425 | 1,064 | 1,337 | 1,295 | 1,950 | 2,982 | 3,209 | 879 | 4,017 | 1,757 | 935 | -- | -- |
| Black walnut | 26,773 | 2,491 | 2,776 | 4,892 | 3,279 | 4,380 | 4,422 | 1,633 | 1,052 | 1,229 | 619 | -- | -- |
| Black cherry | 313,738 | 51,386 | 79,507 | 63,079 | 48,932 | 35,993 | 16,210 | 9,257 | 5,252 | 3,198 | 709 | 215 | -- |
| Butternut | 3,662 | 639 | 575 | 649 | 495 | 954 | 180 | 170 | -- | -- | -- | -- | -- |
| Elm | 278,253 | 57,035 | 58,511 | 46,050 | 40,044 | 30,672 | 18,169 | 11,789 | 8,119 | 2,796 | 3,176 | 1,775 | 117 |
| Paper birch | 813,842 | 206,120 | 247,693 | 184,590 | 101,380 | 43,728 | 21,071 | 5,602 | 1,875 | 972 | 811 | -- | -- |
| Other hardwoods | 87,949 | 16,050 | 12,817 | 14,080 | 7,763 | 8,950 | 6,381 | 1,889 | 4,864 | 2,861 | 7,472 | 4,048 | 774 |
| Total | 13,748,201 | 2,159,039 | 2,729,226 | 2,638,936 | 2,046,548 | 1,481,857 | 1,046,284 | 664,222 | 394,952 | 219,136 | 267,382 | 84,287 | 16,332 |
| All species | 19,103,800 | 3,518,999 | 4,015,782 | 3,538,396 | 2,613,356 | 1,887,839 | 1,340,161 | 854,744 | 526,566 | 309,619 | 375,520 | 105,925 | 16,893 |

Table 31.--Net volume of sawtimber on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 2,606,707 | 245,752 | 262,912 | 395,792 | 359,203 | 335,441 | 282,865 | 253,983 | 369,197 | 98,512 | 3,050 |
| Red pine | 1,890,783 | 555,167 | 419,677 | 275,652 | 280,599 | 184,247 | 102,183 | 48,866 | 24,392 | -- | -- |
| Jack pine | 1,300,487 | 774,513 | 314,310 | 138,633 | 50,032 | 20,615 | 1,812 | 572 | -- | -- | -- |
| White spruce | 1,395,518 | 441,510 | 340,707 | 273,359 | 167,499 | 99,231 | 35,886 | 20,752 | 16,574 | -- | -- |
| Black spruce | 364,731 | 201,770 | 78,275 | 29,730 | 18,267 | 4,423 | 32,266 | -- | -- | -- | -- |
| Balsam fir | 1,086,763 | 620,775 | 312,726 | 102,916 | 39,523 | 6,395 | -- | -- | 4,428 | -- | -- |
| Hemlock | 2,389,793 | 282,309 | 390,235 | 452,204 | 421,267 | 278,507 | 216,938 | 147,581 | 175,778 | 24,463 | 511 |
| Tamarack | 191,493 | 102,837 | 48,218 | 22,607 | 14,167 | 1,212 | 265 | 2,187 | -- | -- | -- |
| Northern white-cedar | 2,648,562 | 1,083,495 | 683,362 | 406,348 | 231,607 | 107,404 | 60,092 | 36,485 | 33,700 | 6,069 | -- |
| Other softwoods | 70,682 | 41,607 | 14,457 | 14,080 | -- | -- | 538 | -- | -- | -- | -- |
| Total | 13,945,519 | 4,349,735 | 2,864,879 | 2,111,321 | 1,582,164 | 1,037,475 | 732,845 | 510,426 | 624,069 | 129,044 | 3,561 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 1,791,072 | -- | 403,874 | 320,643 | 322,193 | 230,985 | 171,607 | 99,935 | 155,806 | 75,595 | 10,434 |
| Select red oaks | 3,903,389 | -- | 958,842 | 849,054 | 719,012 | 537,457 | 329,388 | 211,944 | 244,847 | 50,034 | 2,811 |
| Other red oaks | 931,164 | -- | 250,367 | 202,759 | 164,531 | 148,723 | 54,996 | 40,504 | 55,784 | 13,500 | -- |
| Hickory | 331,572 | -- | 115,043 | 84,589 | 51,982 | 39,287 | 16,621 | 11,831 | 8,099 | 2,273 | 1,847 |
| Yellow birch | 1,516,165 | -- | 309,403 | 350,194 | 292,626 | 218,088 | 124,685 | 91,907 | 94,375 | 23,210 | 11,677 |
| Hard maple | 6,997,862 | -- | 1,719,165 | 1,574,287 | 1,409,004 | 979,582 | 587,289 | 281,607 | 353,767 | 84,781 | 8,380 |
| Soft maple | 4,813,225 | -- | 1,500,241 | 1,188,124 | 792,436 | 506,791 | 320,791 | 166,163 | 229,346 | 90,080 | 19,253 |
| Beech | 1,240,413 | -- | 226,904 | 296,528 | 267,600 | 199,702 | 119,532 | 67,196 | 54,859 | 8,092 | -- |
| Ash | 1,469,167 | -- | 494,039 | 359,718 | 257,378 | 148,361 | 85,018 | 45,869 | 61,564 | 16,261 | 959 |
| Balsam poplar | 811,808 | -- | 237,986 | 215,608 | 156,487 | 89,373 | 59,036 | 33,545 | 13,602 | 6,171 | -- |
| Cottonwood | 291,306 | -- | 38,032 | 41,397 | 55,732 | 22,799 | 30,973 | 25,070 | 40,127 | 27,388 | 9,788 |
| Bigtooth aspen | 1,842,998 | -- | 920,583 | 522,590 | 225,570 | 115,350 | 34,410 | 13,739 | 10,756 | -- | -- |
| Quaking aspen | 3,460,406 | -- | 1,671,421 | 974,041 | 496,973 | 206,150 | 85,765 | 18,861 | 4,981 | 2,214 | -- |
| Basswood | 1,772,955 | -- | 629,342 | 460,074 | 306,248 | 185,936 | 86,081 | 45,558 | 45,738 | 7,525 | 6,453 |
| Yellow-poplar | 87,069 | -- | 10,157 | 15,831 | 17,872 | 4,943 | 22,957 | 10,654 | 4,655 | -- | -- |
| Black walnut | 84,707 | -- | 16,626 | 23,805 | 22,528 | 8,194 | 4,722 | 6,275 | 2,557 | -- | -- |
| Black cherry | 593,837 | -- | 240,419 | 189,808 | 83,187 | 42,815 | 22,223 | 12,788 | 2,095 | 502 | -- |
| Butternut | 8,952 | -- | 2,357 | 4,771 | 1,002 | 822 | -- | -- | -- | -- | -- |
| Elm | 632,956 | -- | 226,609 | 170,183 | 96,668 | 60,434 | 41,216 | 13,209 | 15,634 | 8,436 | 567 |
| Paper birch | 910,295 | -- | 527,494 | 227,962 | 106,895 | 28,965 | 9,769 | 5,114 | 4,096 | -- | -- |
| Other hardwoods | 232,299 | -- | 39,871 | 45,846 | 30,617 | 10,021 | 25,590 | 14,366 | 39,893 | 21,729 | 4,366 |
| Total | 33,723,617 | -- | 10,538,775 | 8,117,812 | 5,876,541 | 3,784,778 | 2,232,669 | 1,216,135 | 1,442,581 | 437,791 | 76,535 |
| All species | 47,669,136 | 4,349,735 | 13,403,654 | 10,229,133 | 7,458,705 | 4,822,253 | 2,965,514 | 1,726,561 | 2,066,650 | 566,835 | 80,096 |

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[1] International 1/4-inch rule.

Table 32.--Net volume of growing stock on commercial forest land by species group and forest type, Michigan, 1980

(In thousand cubic feet)

| Species group | All types | Forest type |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 543,535 | 11,902 | 31,015 | 172,551 | 28,925 | 6,342 | 17,407 | 37,742 |
| Red pine | 713,841 | 58,444 | 499,773 | 25,852 | 4,596 | 1,824 | 6,365 | 1,844 |
| Jack pine | 628,201 | 461,954 | 61,819 | 4,609 | 697 | 976 | 17,877 | -- |
| White spruce | 396,698 | 537 | 3,428 | 9,528 | 110,501 | 49,421 | 5,492 | 38,159 |
| Black spruce | 343,499 | 8,060 | 2,849 | 6,124 | 31,832 | 2,733 | 174,509 | 74,651 |
| Balsam fir | 780,816 | 1,100 | 4,497 | 8,198 | 210,614 | 11,437 | 23,845 | 107,103 |
| Hemlock | 486,735 | -- | 1,337 | 2,064 | 8,873 | 174 | 2,310 | 13,608 |
| Tamarack | 108,188 | 211 | 292 | 590 | 5,896 | 497 | 13,815 | 34,340 |
| Northern white-cedar | 1,297,942 | 136 | 947 | 3,004 | 61,126 | 11,408 | 31,317 | 840,496 |
| Other softwoods | 56,144 | -- | 3,185 | 5,557 | 81 | 1,678 | 77 | 1,029 |
| Total | 5,355,599 | 542,344 | 609,142 | 238,077 | 463,141 | 86,490 | 293,014 | 1,148,972 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 561,599 | 2,791 | 8,103 | 4,410 | -- | -- | -- | -- |
| Select red oaks | 1,166,227 | 31,761 | 15,069 | 8,034 | 498 | -- | -- | -- |
| Other red oaks | 291,036 | 13,037 | 10,964 | -- | -- | -- | -- | -- |
| Hickory | 105,470 | 306 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 466,546 | -- | -- | 468 | 12,406 | 310 | 1,482 | 15,136 |
| Hard maple | 2,748,772 | 145 | 1,640 | 3,121 | 5,869 | 1,264 | 813 | 5,019 |
| Soft maple | 2,252,752 | 4,600 | 10,239 | 10,205 | 40,412 | 2,746 | 4,680 | 44,527 |
| Beech | 337,921 | -- | 515 | 312 | 216 | 108 | -- | -- |
| Ash | 677,231 | -- | 278 | -- | 4,217 | -- | 1,787 | 26,146 |
| Balsam poplar | 240,668 | -- | 90 | 390 | 11,340 | 2,743 | 1,190 | 27,339 |
| Cottonwood | 70,608 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 903,436 | 3,539 | 11,685 | 3,447 | 2,162 | 215 | 1,995 | 5,280 |
| Quaking aspen | 1,713,956 | 14,681 | 13,378 | 13,659 | 58,582 | 16,604 | 24,248 | 28,504 |
| Basswood | 668,337 | 464 | 712 | 206 | 318 | -- | -- | 1,753 |
| Yellow-poplar | 19,425 | -- | 344 | -- | -- | -- | -- | -- |
| Black walnut | 26,773 | -- | 200 | -- | -- | -- | -- | -- |
| Black cherry | 313,738 | 365 | 2,304 | 971 | 3,753 | 1,347 | 316 | 705 |
| Butternut | 3,662 | -- | -- | -- | -- | -- | -- | 350 |
| Elm | 278,253 | 144 | -- | 191 | 5,033 | 432 | -- | 2,084 |
| Paper birch | 813,842 | 1,032 | 4,700 | 16,916 | 47,127 | 3,205 | 13,074 | 93,644 |
| Other hardwoods | 87,949 | 183 | -- | -- | -- | -- | -- | 336 |
| Total | 13,748,201 | 73,048 | 80,221 | 62,330 | 191,933 | 28,974 | 49,585 | 250,823 |
| All species | 19,103,800 | 615,392 | 689,363 | 300,407 | 655,074 | 115,464 | 342,599 | 1,399,795 |

(Table 32 continued on next page)

(Table 32 continued)

| Species group | Forest type |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 1,283 | 29,318 | 16,928 | 125,352 | 55,255 | 7,570 | 1,779 | 166 |
| Red pine | 223 | 30,862 | 2,656 | 21,444 | 50,264 | 3,906 | 5,395 | 393 |
| Jack pine | 570 | 41,612 | -- | 10,866 | 22,781 | 3,025 | 837 | 578 |
| White spruce | 53 | 700 | 14,481 | 84,845 | 66,443 | 13,078 | -- | 32 |
| Black spruce | 5,512 | 390 | 7,721 | 11,631 | 14,401 | 2,969 | -- | 117 |
| Balsam fir | 2,107 | 1,909 | 37,846 | 188,078 | 158,522 | 25,226 | -- | 334 |
| Hemlock | -- | 1,228 | 20,506 | 423,029 | 9,741 | 3,865 | -- | -- |
| Tamarack | 34,282 | -- | 6,843 | 2,489 | 6,315 | 2,383 | -- | 235 |
| Northern white-cedar | 6,026 | 402 | 73,348 | 133,030 | 107,608 | 28,822 | 109 | 163 |
| Other softwoods | -- | 1,886 | 389 | 9,644 | 256 | -- | 32,362 | -- |
| Total | 50,056 | 108,307 | 180,718 | 1,010,408 | 491,586 | 90,844 | 40,482 | 2,018 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | -- | 434,450 | 24,234 | 65,885 | 20,927 | 799 | -- | -- |
| Select red oaks | -- | 744,332 | 12,490 | 221,794 | 123,867 | 7,415 | 809 | 158 |
| Other red oaks | -- | 241,835 | 2,919 | 15,058 | 6,912 | -- | 311 | -- |
| Hickory | -- | 61,941 | 2,953 | 39,599 | 500 | 171 | -- | -- |
| Yellow birch | -- | 966 | 29,696 | 396,494 | 6,788 | 2,674 | 126 | -- |
| Hard maple | -- | 15,044 | 17,493 | 2,626,787 | 57,024 | 14,110 | 443 | -- |
| Soft maple | 88 | 118,172 | 472,280 | 1,255,908 | 247,798 | 40,254 | 415 | 428 |
| Beech | -- | 3,634 | 3,220 | 322,627 | 6,738 | 551 | -- | -- |
| Ash | 248 | 29,692 | 223,683 | 340,804 | 41,845 | 8,164 | 92 | 275 |
| Balsam poplar | 894 | 638 | 16,496 | 17,936 | 155,421 | 5,594 | 415 | 182 |
| Cottonwood | -- | 5,979 | 33,311 | 21,019 | 10,299 | -- | -- | -- |
| Bigtooth aspen | -- | 116,647 | 8,105 | 160,182 | 577,838 | 12,307 | -- | 34 |
| Quaking aspen | 1,434 | 25,033 | 57,237 | 331,814 | 1,089,695 | 37,583 | 1,192 | 312 |
| Basswood | -- | 9,220 | 25,710 | 602,093 | 22,638 | 4,786 | 437 | -- |
| Yellow-poplar | -- | 2,537 | 1,945 | 14,599 | -- | -- | -- | -- |
| Black walnut | -- | 18,533 | 2,782 | 5,258 | -- | -- | -- | -- |
| Black cherry | -- | 46,643 | 18,029 | 214,027 | 23,694 | 645 | 627 | 312 |
| Butternut | -- | 1,205 | 776 | 1,331 | -- | -- | -- | -- |
| Elm | -- | 4,593 | 51,128 | 192,580 | 20,668 | 1,224 | 113 | 63 |
| Paper birch | 1,338 | 15,538 | 36,693 | 158,826 | 205,306 | 216,225 | -- | 218 |
| Other hardwoods | -- | 9,164 | 35,937 | 39,831 | 2,324 | 174 | -- | -- |
| Total | 4,002 | 1,905,796 | 1,077,117 | 7,044,452 | 2,620,282 | 352,676 | 4,980 | 1,982 |
| All species | 54,058 | 2,014,103 | 1,257,835 | 8,054,860 | 3,111,868 | 443,520 | 45,462 | 4,000 |

Table 33.--Net volume of sawtimber on commercial forest land by species group and forest type, Michigan, 1980

(In thousand board feet)[1]

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 2,606,707 | 56,083 | 128,503 | 828,705 | 148,720 | 29,388 | 87,338 | 207,039 |
| Red pine | 1,890,783 | 207,759 | 1,092,156 | 118,307 | 22,596 | 8,101 | 26,939 | 9,905 |
| Jack pine | 1,300,487 | 925,465 | 114,400 | 14,144 | 1,473 | 3,177 | 46,222 | -- |
| White spruce | 1,395,518 | 2,243 | 5,145 | 32,189 | 400,011 | 140,131 | 21,352 | 136,863 |
| Black spruce | 364,731 | 4,124 | 3,427 | 8,844 | 55,703 | 3,462 | 129,699 | 93,800 |
| Balsam fir | 1,086,763 | 4,368 | 6,895 | 11,756 | 284,346 | 21,129 | 37,322 | 103,633 |
| Hemlock | 2,389,793 | -- | 3,740 | 10,656 | 42,679 | 1,049 | 11,251 | 69,880 |
| Tamarack | 191,493 | -- | 839 | 2,371 | 15,250 | 1,171 | 13,299 | 49,893 |
| Northern white-cedar | 2,648,562 | -- | 1,028 | 4,989 | 168,235 | 24,352 | 86,486 | 1,526,267 |
| Other softwoods | 70,682 | -- | 4,129 | 9,545 | -- | 1,449 | -- | |
| Total | 13,945,519 | 1,200,042 | 1,360,262 | 1,041,506 | 1,139,013 | 233,409 | 459,908 | 2,197,280 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 1,791,072 | 7,720 | 28,425 | 19,367 | -- | -- | -- | -- |
| Select red oaks | 3,903,389 | 75,759 | 60,740 | 16,939 | -- | -- | -- | -- |
| Other red oaks | 931,164 | 29,528 | 32,664 | -- | -- | -- | -- | -- |
| Hickory | 331,572 | 1,337 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 1,516,165 | -- | -- | 1,076 | 48,015 | 674 | 5,897 | 49,338 |
| Hard maple | 6,997,862 | -- | 1,786 | 5,602 | 15,336 | 1,491 | 1,943 | 11,483 |
| Soft maple | 4,813,225 | 3,610 | 12,385 | 11,269 | 70,336 | -- | 3,801 | 75,481 |
| Beech | 1,240,413 | -- | 2,857 | -- | -- | 634 | -- | -- |
| Ash | 1,469,167 | -- | 686 | -- | 3,813 | -- | 786 | 16,933 |
| Balsam poplar | 811,808 | -- | 511 | 681 | 33,597 | 9,770 | 1,319 | 85,881 |
| Cottonwood | 291,306 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 1,842,998 | 3,914 | 12,941 | 6,801 | 9,487 | 1,235 | 1,252 | 19,573 |
| Quaking aspen | 3,460,406 | 4,399 | 4,879 | 18,101 | 102,656 | 19,864 | 18,856 | 84,063 |
| Basswood | 1,772,955 | 1,212 | 2,317 | -- | 1,127 | -- | -- | 4,880 |
| Yellow-poplar | 87,069 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 84,707 | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 593,837 | -- | 2,261 | 1,847 | 2,127 | 3,160 | -- | 456 |
| Butternut | 8,952 | -- | -- | -- | -- | -- | -- | 1,824 |
| Elm | 632,956 | -- | -- | -- | 7,609 | 1,298 | -- | 4,713 |
| Paper birch | 910,295 | 667 | 5,202 | 27,123 | 57,417 | 1,846 | 16,312 | 106,726 |
| Other hardwoods | 232,299 | -- | -- | -- | -- | -- | -- | 878 |
| Total | 33,723,617 | 128,146 | 167,654 | 108,806 | 351,520 | 39,972 | 50,166 | 462,229 |
| All species | 47,669,136 | 1,328,188 | 1,527,916 | 1,150,312 | 1,490,533 | 273,381 | 510,074 | 2,659,509 |

(Table 33 continued on next page)

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[1] International 1/4-inch rule.

(Table 33 continued)

| Species group | Forest type |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Tamarack | Oak hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 5,626 | 123,802 | 88,393 | 598,885 | 262,124 | 34,777 | 6,709 | 615 |
| Red pine | 1,175 | 92,455 | 10,881 | 71,883 | 205,124 | 18,773 | 3,568 | 1,161 |
| Jack pine | 2,506 | 95,371 | -- | 25,135 | 53,470 | 13,711 | 4,183 | 1,230 |
| White spruce | -- | 1,647 | 58,452 | 335,397 | 223,168 | 38,762 | -- | 158 |
| Black spruce | 6,362 | 696 | 15,132 | 26,732 | 14,227 | 2,006 | -- | 517 |
| Balsam fir | 1,503 | 2,132 | 45,254 | 334,135 | 210,542 | 23,129 | -- | 619 |
| Hemlock | -- | 4,655 | 90,970 | 2,108,068 | 33,196 | 13,649 | -- | -- |
| Tamarack | 57,353 | -- | 15,435 | 12,574 | 19,002 | 3,190 | -- | 1,116 |
| Northern white-cedar | 12,403 | 1,324 | 170,533 | 428,636 | 178,311 | 45,597 | -- | 401 |
| Other softwoods | -- | 9,284 | -- | 10,708 | 538 | -- | 35,029 | -- |
| Total | 86,928 | 331,366 | 495,050 | 3,952,153 | 1,199,702 | 193,594 | 49,489 | 5,817 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | -- | 1,296,511 | 101,861 | 262,546 | 71,666 | 2,976 | -- | -- |
| Select red oaks | -- | 2,391,024 | 52,234 | 901,657 | 382,868 | 20,282 | 972 | 914 |
| Other red oaks | -- | 771,731 | 13,136 | 63,396 | 20,709 | -- | -- | -- |
| Hickory | -- | 194,063 | 7,907 | 125,213 | 2,102 | 950 | -- | -- |
| Yellow birch | -- | 1,619 | 87,716 | 1,309,495 | 8,830 | 2,746 | 759 | -- |
| Hard maple | -- | 29,395 | 43,280 | 6,803,486 | 58,648 | 23,945 | 1,467 | -- |
| Soft maple | -- | 174,085 | 1,425,181 | 2,757,752 | 244,043 | 32,127 | 1,556 | 1,599 |
| Beech | -- | 8,305 | 9,614 | 1,213,367 | 5,198 | 438 | -- | -- |
| Ash | -- | 81,152 | 471,798 | 840,298 | 50,703 | 2,522 | 476 | -- |
| Balsam poplar | 3,193 | 2,592 | 64,163 | 67,138 | 524,253 | 17,967 | -- | 743 |
| Cottonwood | -- | 30,343 | 122,000 | 93,323 | 45,640 | -- | -- | -- |
| Bigtooth aspen | -- | 194,329 | 20,154 | 436,493 | 1,108,032 | 28,787 | -- | -- |
| Quaking aspen | 2,090 | 23,213 | 135,407 | 874,387 | 2,089,131 | 83,360 | -- | -- |
| Basswood | -- | 20,331 | 82,824 | 1,602,968 | 43,577 | 13,719 | -- | -- |
| Yellow-poplar | -- | 12,171 | 11,117 | 63,781 | -- | -- | -- | -- |
| Black walnut | -- | 63,602 | 7,117 | 13,988 | -- | -- | -- | -- |
| Black cherry | -- | 99,467 | 43,926 | 408,161 | 30,675 | -- | 1,757 | -- |
| Butternut | -- | 1,857 | 2,605 | 2,666 | -- | -- | -- | -- |
| Elm | -- | 3,735 | 88,410 | 499,350 | 25,705 | 2,136 | -- | -- |
| Paper birch | 773 | 17,695 | 55,706 | 274,455 | 172,374 | 173,999 | -- | -- |
| Other hardwoods | -- | 13,751 | 120,775 | 92,655 | 3,357 | 883 | -- | -- |
| Total | 6,056 | 5,430,971 | 2,966,931 | 18,706,575 | 4,887,511 | 406,837 | 6,987 | 3,256 |
| All species | 92,984 | 5,762,337 | 3,461,981 | 22,658,728 | 6,087,213 | 600,431 | 56,476 | 9,073 |

## Table 34.--Net volume of growing stock on commercial forest land by species group and ownership class, Michigan, 1980

(In thousand cubic feet)

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 543,535 | 71,803 | -- | 420 | -- | 143,919 | 3,076 | 62,007 | 51,182 | 73,680 | 137,448 |
| Red pine | 713,841 | 299,569 | -- | 1,159 | -- | 197,218 | 16,476 | 15,912 | 50,162 | 38,253 | 95,092 |
| Jack pine | 628,201 | 231,742 | -- | 5,290 | -- | 235,355 | 9,235 | 12,412 | 23,397 | 19,591 | 91,179 |
| White spruce | 396,698 | 99,104 | -- | 844 | 336 | 68,625 | 1,989 | 72,882 | 31,569 | 52,630 | 68,719 |
| Black spruce | 343,499 | 87,732 | -- | 94 | 149 | 101,819 | 3,182 | 56,850 | 16,454 | 25,289 | 51,930 |
| Balsam fir | 780,816 | 132,536 | -- | 2,774 | 207 | 158,226 | 5,748 | 152,382 | 78,923 | 79,301 | 170,719 |
| Hemlock | 486,735 | 74,200 | -- | 184 | 2,926 | 54,960 | 5,958 | 160,578 | 49,088 | 44,736 | 94,105 |
| Tamarack | 108,188 | 6,892 | -- | -- | 119 | 36,706 | 776 | 18,103 | 15,988 | 5,679 | 23,926 |
| Northern white-cedar | 1,297,942 | 112,202 | -- | 242 | 509 | 334,415 | 10,355 | 230,070 | 197,862 | 133,630 | 278,657 |
| Other softwoods | 56,144 | 519 | -- | -- | -- | 489 | -- | -- | 19,309 | 5,723 | 30,104 |
| Total | 5,355,599 | 1,116,299 | -- | 11,007 | 4,245 | 1,331,732 | 56,795 | 781,196 | 533,934 | 478,512 | 1,041,879 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 561,599 | 65,370 | -- | 746 | -- | 79,858 | 3,710 | 1,515 | 159,411 | 37,002 | 213,987 |
| Select red oaks | 1,166,227 | 46,232 | -- | 259 | 258 | 264,995 | 11,614 | 29,257 | 240,128 | 123,030 | 450,454 |
| Other red oaks | 291,036 | 127,334 | -- | 414 | -- | 24,074 | 3,457 | 1,487 | 37,170 | 9,580 | 87,520 |
| Hickory | 105,470 | -- | -- | -- | -- | 3,127 | 1,268 | -- | 65,033 | 1,320 | 34,722 |
| Yellow birch | 466,546 | 83,450 | -- | 1,348 | 3,879 | 48,908 | 5,050 | 148,567 | 33,869 | 56,980 | 84,495 |
| Hard maple | 2,748,772 | 384,544 | -- | 379 | 9,827 | 307,853 | 26,335 | 615,682 | 500,156 | 287,078 | 616,918 |
| Soft maple | 2,252,752 | 269,855 | -- | 1,506 | 5,924 | 379,071 | 19,259 | 305,003 | 403,680 | 235,554 | 632,900 |
| Beech | 337,921 | 43,943 | -- | -- | -- | 35,432 | 2,084 | 75,704 | 78,217 | 21,466 | 81,075 |
| Ash | 677,231 | 52,200 | -- | 95 | 682 | 76,048 | 10,141 | 54,736 | 213,810 | 48,155 | 221,364 |
| Balsam poplar | 240,668 | 7,358 | -- | -- | 237 | 51,545 | 118 | 25,682 | 60,068 | 18,241 | 77,419 |
| Cottonwood | 70,608 | -- | -- | -- | -- | 1,790 | -- | 1,266 | 40,493 | 5,060 | 21,999 |
| Bigtooth aspen | 903,436 | 87,344 | -- | -- | 3,801 | 211,848 | 11,336 | 22,935 | 151,406 | 77,617 | 337,149 |
| Quaking aspen | 1,713,956 | 280,640 | -- | 3,589 | 5,177 | 340,094 | 17,971 | 144,165 | 259,747 | 167,355 | 495,218 |
| Basswood | 668,337 | 68,435 | -- | -- | 624 | 115,920 | 5,355 | 52,784 | 169,803 | 58,674 | 196,742 |
| Yellow-poplar | 19,425 | -- | -- | -- | -- | -- | -- | -- | 9,225 | 342 | 9,858 |
| Black walnut | 26,773 | -- | -- | -- | -- | -- | -- | -- | 14,379 | 325 | 12,069 |
| Black cherry | 313,738 | 43,551 | -- | -- | 85 | 43,916 | 2,877 | 28,817 | 95,817 | 18,062 | 80,613 |
| Butternut | 3,662 | -- | -- | -- | -- | -- | 471 | -- | 1,903 | 325 | 963 |
| Elm | 278,253 | 46,227 | -- | 156 | 842 | 32,190 | 4,265 | 37,993 | 61,883 | 23,933 | 70,764 |
| Paper birch | 813,842 | 99,472 | -- | 1,864 | 526 | 192,338 | 2,774 | 100,739 | 116,873 | 85,376 | 213,880 |
| Other hardwoods | 87,949 | -- | -- | -- | -- | 2,536 | 1,813 | 348 | 32,658 | 6,793 | 43,801 |
| Total | 13,748,201 | 1,705,955 | -- | 10,356 | 31,862 | 2,211,543 | 129,898 | 1,646,680 | 2,745,729 | 1,282,268 | 3,983,910 |
| All species | 19,103,800 | 2,822,254 | -- | 21,363 | 36,107 | 3,543,275 | 186,693 | 2,427,876 | 3,279,663 | 1,760,780 | 5,025,789 |

Table 35.--Net volume of sawtimber on commercial forest land by species group and ownership class, Michigan, 1980

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 2,606,707 | 372,730 | -- | -- | -- | 694,363 | 12,466 | 319,199 | 235,687 | 370,732 | 601,530 |
| Red pine | 1,890,783 | 572,681 | -- | 5,931 | -- | 693,096 | 51,655 | 67,808 | 95,694 | 115,959 | 287,959 |
| Jack pine | 1,300,487 | 411,769 | -- | 11,800 | -- | 501,957 | 19,055 | 27,381 | 59,418 | 63,338 | 205,769 |
| White spruce | 1,395,518 | 374,814 | -- | 3,428 | 709 | 241,522 | 6,103 | 253,636 | 107,513 | 193,199 | 214,594 |
| Black spruce | 364,731 | 86,413 | -- | -- | -- | 97,025 | 5,469 | 62,025 | 16,414 | 36,868 | 60,517 |
| Balsam fir | 1,086,763 | 190,226 | -- | 8,155 | 428 | 218,627 | 8,988 | 203,815 | 89,393 | 124,874 | 242,257 |
| Hemlock | 2,389,793 | 384,936 | -- | 1,062 | 15,318 | 261,926 | 28,492 | 834,703 | 210,855 | 222,938 | 429,563 |
| Tamarack | 191,493 | 9,045 | -- | -- | -- | 55,670 | 1,460 | 33,953 | 31,210 | 15,350 | 44,805 |
| Northern white-cedar | 2,648,562 | 212,903 | -- | 409 | 1,535 | 621,502 | 31,029 | 590,033 | 291,924 | 359,497 | 539,730 |
| Other softwoods | 70,682 | 1,800 | -- | -- | -- | -- | -- | -- | 18,400 | 11,143 | 39,339 |
| Total | 13,945,519 | 2,617,317 | -- | 30,785 | 17,990 | 3,385,688 | 164,717 | 2,392,553 | 1,156,508 | 1,513,898 | 2,666,063 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 1,791,072 | 134,945 | -- | -- | -- | 217,558 | 4,753 | 4,086 | 668,357 | 122,079 | 639,294 |
| Select red oaks | 3,903,389 | 138,126 | -- | 886 | 1,410 | 737,124 | 31,612 | 96,353 | 978,841 | 407,642 | 1,511,395 |
| Other red oaks | 931,164 | 321,540 | -- | -- | -- | 82,067 | 1,104 | 6,670 | 147,488 | 35,527 | 336,768 |
| Hickory | 331,572 | -- | -- | -- | -- | 5,920 | 4,603 | -- | 204,827 | 3,962 | 112,260 |
| Yellow birch | 1,516,165 | 260,600 | -- | 4,587 | 12,291 | 157,684 | 14,568 | 556,720 | 89,341 | 172,867 | 247,507 |
| Hard maple | 6,997,862 | 1,058,534 | -- | 1,527 | 17,452 | 601,569 | 51,544 | 2,061,326 | 1,162,195 | 775,149 | 1,268,566 |
| Soft maple | 4,813,225 | 431,522 | -- | 3,995 | 5,783 | 670,655 | 42,721 | 717,415 | 1,027,008 | 505,925 | 1,408,201 |
| Beech | 1,240,413 | 146,324 | -- | -- | -- | 115,705 | 7,034 | 313,414 | 291,195 | 72,481 | 294,260 |
| Ash | 1,469,167 | 79,123 | -- | -- | 1,855 | 142,117 | 23,057 | 132,497 | 489,237 | 115,067 | 486,214 |
| Balsam poplar | 811,808 | 37,265 | -- | -- | 1,295 | 163,947 | -- | 80,472 | 192,608 | 70,925 | 265,296 |
| Cottonwood | 291,306 | -- | -- | -- | -- | 9,101 | -- | 6,805 | 171,798 | 15,811 | 87,791 |
| Bigtooth aspen | 1,842,998 | 122,224 | -- | -- | 10,541 | 406,538 | 33,178 | 55,701 | 359,401 | 161,933 | 693,482 |
| Quaking aspen | 3,460,406 | 528,501 | -- | -- | 8,265 | 703,293 | 30,176 | 279,609 | 524,340 | 381,148 | 1,005,074 |
| Basswood | 1,772,955 | 139,470 | -- | -- | 3,436 | 268,331 | 6,949 | 149,881 | 476,167 | 168,729 | 559,992 |
| Yellow-poplar | 87,069 | -- | -- | -- | -- | -- | -- | -- | 44,619 | 1,480 | 40,970 |
| Black walnut | 84,707 | -- | -- | -- | -- | -- | -- | -- | 44,944 | -- | 39,763 |
| Black cherry | 593,837 | 74,218 | -- | -- | -- | 81,652 | 2,053 | 34,957 | 220,347 | 28,097 | 152,513 |
| Butternut | 8,952 | -- | -- | -- | -- | -- | 2,605 | -- | 3,251 | 1,692 | 1,404 |
| Elm | 632,956 | 115,651 | -- | -- | 3,034 | 74,179 | 9,797 | 109,319 | 111,078 | 64,669 | 145,229 |
| Paper birch | 910,295 | 98,211 | -- | 2,331 | -- | 208,713 | 3,358 | 140,619 | 123,149 | 107,438 | 226,476 |
| Other hardwoods | 232,299 | -- | -- | -- | -- | 1,761 | 6,999 | 1,755 | 92,571 | 22,797 | 106,416 |
| Total | 33,723,617 | 3,686,254 | -- | 13,326 | 65,362 | 4,647,914 | 276,111 | 4,747,599 | 7,422,762 | 3,235,418 | 9,628,871 |
| All species | 47,669,136 | 6,303,571 | -- | 44,111 | 83,352 | 8,033,602 | 440,828 | 7,140,152 | 8,579,270 | 4,749,316 | 12,294,934 |

[1] International 1/4-inch rule.

Table 36.--Net volume of growing stock on commercial forest land by forest type and stand-age class, Michigan, 1980

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 615,392 | 18,064 | 31,194 | 39,905 | 118,623 | 196,292 | 103,018 | 46,685 | 43,209 | 11,921 | 3,936 | 1,667 | 878 | -- |
| Red pine | 689,363 | 4,793 | 41,675 | 211,338 | 182,790 | 96,315 | 11,932 | 38,590 | 23,998 | 25,121 | 17,043 | 33,823 | 1,945 | -- |
| White pine | 300,407 | 1,409 | 7,174 | 9,903 | 3,519 | 23,171 | 17,532 | 64,425 | 40,821 | 41,210 | 36,042 | 20,581 | 24,198 | 10,422 |
| Balsam fir | 655,074 | 22,275 | 27,869 | 21,273 | 65,961 | 166,790 | 103,224 | 75,671 | 56,369 | 33,749 | 25,265 | 34,626 | 15,696 | 6,306 |
| White spruce | 115,464 | 2,776 | 6,380 | 550 | 20,974 | 15,636 | 16,045 | 10,097 | 7,163 | 14,429 | -- | 17,297 | -- | 4,117 |
| Black spruce | 342,599 | 20,336 | 21,784 | 51,867 | 60,672 | 39,775 | 46,405 | 34,615 | 20,929 | 3,067 | 8,474 | 17,834 | 10,661 | 6,180 |
| Northern white-cedar | 1,399,795 | 9,314 | 20,087 | 39,295 | 41,300 | 59,906 | 142,568 | 184,924 | 169,968 | 188,128 | 137,008 | 206,687 | 104,044 | 96,566 |
| Tamarack | 54,058 | 3,761 | 6,488 | 5,686 | 1,777 | 3,249 | 11,564 | 7,516 | 4,094 | 1,686 | 4,238 | 2,025 | -- | 1,974 |
| Oak-hickory | 2,014,103 | 57,066 | 49,435 | 14,251 | 99,431 | 228,999 | 349,390 | 262,105 | 264,484 | 207,987 | 127,770 | 275,994 | 68,391 | 8,800 |
| Elm-ash-soft maple | 1,257,835 | 53,302 | 55,065 | 50,454 | 111,034 | 120,713 | 143,501 | 118,266 | 130,197 | 140,663 | 81,289 | 161,304 | 65,493 | 26,554 |
| Maple-birch | 8,054,860 | 183,915 | 180,837 | 166,791 | 446,673 | 1,270,338 | 1,263,149 | 770,979 | 599,598 | 772,680 | 697,995 | 1,034,839 | 473,650 | 193,416 |
| Aspen | 3,111,868 | 202,827 | 203,564 | 86,556 | 402,194 | 626,643 | 637,859 | 368,606 | 260,640 | 130,945 | 92,231 | 86,108 | 13,695 | -- |
| Paper birch | 443,520 | 13,173 | 10,805 | 5,020 | 29,841 | 53,730 | 144,223 | 100,170 | 39,853 | 12,418 | 18,144 | 5,355 | 8,160 | 2,628 |
| Exotic | 45,462 | 474 | 5,178 | 17,451 | 10,676 | 2,130 | 9,553 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 4,000 | 674 | 614 | 310 | 396 | 702 | 806 | -- | -- | 498 | -- | -- | -- | -- |
| All types | 19,103,800 | 594,159 | 668,149 | 720,650 | 1,595,861 | 2,904,389 | 3,000,769 | 2,082,649 | 1,661,323 | 1,584,502 | 1,249,435 | 1,898,140 | 786,811 | 356,963 |

Table 37.--Net volume of sawtimber on commercial forest land by forest type and stand-age class, Michigan, 1980

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 1,328,188 | 34,476 | 58,976 | 41,761 | 246,450 | 346,649 | 259,384 | 140,922 | 137,978 | 37,069 | 16,750 | 5,119 | 2,654 | -- |
| Red pine | 1,527,916 | 4,758 | 63,557 | 211,694 | 367,983 | 243,041 | 51,626 | 147,657 | 105,097 | 97,735 | 80,896 | 147,960 | 5,912 | -- |
| White pine | 1,150,312 | 3,831 | 32,490 | 15,759 | 9,729 | 58,223 | 60,421 | 236,866 | 160,103 | 172,774 | 159,280 | 87,615 | 107,124 | 46,097 |
| Balsam fir | 1,490,533 | 46,060 | 45,458 | 34,011 | 103,618 | 412,748 | 187,869 | 151,232 | 145,324 | 99,527 | 80,621 | 108,906 | 51,487 | 23,672 |
| White spruce | 273,381 | 8,676 | 15,436 | -- | 13,030 | 40,915 | 33,184 | 29,084 | 18,234 | 44,118 | -- | 59,800 | -- | 10,904 |
| Black spruce | 510,074 | 24,688 | 34,696 | 96,328 | 48,126 | 52,490 | 49,147 | 48,910 | 20,055 | -- | 27,647 | 56,370 | 31,922 | 19,695 |
| Northern white-cedar | 2,659,509 | 12,064 | 25,631 | 37,382 | 38,966 | 90,494 | 190,913 | 230,074 | 217,745 | 326,995 | 321,321 | 547,186 | 310,918 | 309,820 |
| Tamarack | 92,984 | 7,040 | 13,529 | 9,183 | 1,014 | 3,518 | 14,236 | 10,619 | 9,796 | 962 | 10,118 | 5,151 | -- | 7,818 |
| Oak-hickory | 5,762,337 | 161,827 | 148,812 | 26,855 | 174,678 | 443,567 | 574,879 | 602,320 | 920,610 | 761,422 | 498,250 | 1,092,677 | 315,899 | 40,541 |
| Elm-ash-soft maple | 3,461,981 | 117,039 | 98,156 | 68,647 | 216,754 | 211,150 | 353,058 | 266,998 | 396,219 | 524,978 | 281,896 | 622,227 | 212,300 | 92,559 |
| Maple-birch | 22,658,728 | 422,925 | 440,118 | 322,354 | 804,328 | 2,257,431 | 2,448,171 | 2,019,740 | 1,841,658 | 2,666,833 | 2,566,641 | 4,006,027 | 1,982,844 | 879,658 |
| Aspen | 6,087,213 | 319,782 | 318,709 | 116,412 | 556,031 | 927,480 | 1,122,453 | 906,525 | 760,533 | 408,156 | 303,926 | 300,890 | 46,316 | -- |
| Paper birch | 600,431 | 18,994 | 15,468 | 1,184 | 33,495 | 70,562 | 153,035 | 114,094 | 73,246 | 28,408 | 47,952 | 16,802 | 20,603 | 6,588 |
| Exotic | 56,476 | -- | 4,393 | 4,947 | 8,015 | 660 | 38,461 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 9,073 | 379 | 568 | -- | -- | 3,175 | 3,304 | -- | -- | 1,647 | -- | -- | -- | -- |
| All types | 47,669,136 | 1,182,539 | 1,315,997 | 986,517 | 2,622,217 | 5,162,103 | 5,540,141 | 4,905,041 | 4,806,598 | 5,170,624 | 4,395,298 | 7,056,730 | 3,087,979 | 1,437,352 |

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[1] International 1/4-inch rule.

Table 38.--Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Michigan, 1980

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
|---|---|---|---|---|---|---|---|---|
| Jack pine | | | | | | | | |
| Sawtimber | 155,794 | -- | -- | 1,956 | 4,528 | 14,559 | 17,817 | 30,078 |
| Poletimber | 400,160 | -- | 1,041 | 5,903 | 7,504 | 38,393 | 21,069 | 38,172 |
| Sapling & seedling | 59,438 | 512 | 2,446 | 2,112 | 9,902 | 8,962 | 10,548 | 9,378 |
| All stands | 615,392 | 512 | 3,487 | 9,971 | 21,934 | 61,914 | 49,434 | 77,628 |
| Red pine | | | | | | | | |
| Sawtimber | 221,394 | -- | 619 | -- | 4,439 | 5,782 | 1,378 | 10,741 |
| Poletimber | 428,759 | -- | -- | -- | 1,238 | 4,638 | 6,594 | 9,923 |
| Sapling & seedling | 39,210 | 743 | 398 | 2,487 | 1,220 | 885 | 12,958 | 3,391 |
| All stands | 689,363 | 743 | 1,017 | 2,487 | 6,897 | 11,305 | 20,930 | 24,055 |
| White pine | | | | | | | | |
| Sawtimber | 254,076 | -- | -- | 583 | 3,236 | 3,182 | 2,414 | 10,288 |
| Poletimber | 36,380 | -- | -- | -- | -- | 2,990 | 2,641 | 3,885 |
| Sapling & seedling | 9,951 | 283 | 765 | 1,587 | 846 | 1,453 | 1,914 | 3,103 |
| All stands | 300,407 | 283 | 765 | 2,170 | 4,082 | 7,625 | 6,969 | 17,276 |
| Balsam fir | | | | | | | | |
| Sawtimber | 219,392 | -- | -- | -- | -- | -- | 7,816 | 1,569 |
| Poletimber | 367,071 | -- | -- | 549 | 1,171 | 6,299 | 3,200 | 24,170 |
| Sapling & seedling | 68,611 | 129 | 2,110 | 2,498 | 8,326 | 9,964 | 6,245 | 12,061 |
| All stands | 655,074 | 129 | 2,110 | 3,047 | 9,497 | 16,263 | 17,261 | 37,800 |
| White spruce | | | | | | | | |
| Sawtimber | 48,732 | -- | -- | -- | 589 | 1,369 | -- | 1,993 |
| Poletimber | 57,027 | -- | -- | -- | -- | 782 | -- | 1,083 |
| Sapling & seedling | 9,705 | -- | 643 | 502 | 1,228 | 1,236 | 1,004 | 1,522 |
| All stands | 115,464 | -- | 643 | 502 | 1,817 | 3,387 | 1,004 | 4,598 |
| Black spruce | | | | | | | | |
| Sawtimber | 17,665 | -- | -- | -- | -- | -- | 1,330 | -- |
| Poletimber | 251,865 | 174 | -- | 710 | 28,464 | 4,343 | 9,853 | 10,205 |
| Sapling & seedling | 73,069 | 347 | 7,368 | 905 | 6,129 | 11,755 | 6,871 | 14,348 |
| All stands | 342,599 | 521 | 7,368 | 1,615 | 34,593 | 16,098 | 18,054 | 24,553 |
| Northern white-cedar | | | | | | | | |
| Sawtimber | 491,375 | -- | -- | -- | 2,403 | 1,679 | 3,030 | 6,397 |
| Poletimber | 821,372 | -- | -- | -- | 1,709 | 944 | 2,625 | 7,854 |
| Sapling & seedling | 87,048 | 222 | 598 | 866 | 1,600 | 4,219 | 2,266 | 7,121 |
| All stands | 1,399,795 | 222 | 598 | 866 | 5,712 | 6,842 | 7,921 | 21,372 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | 8,873 | -- | -- | 962 | 1,004 | 1,974 | -- | -- |
| Poletimber | 27,784 | -- | -- | -- | 1,725 | 2,559 | 2,901 | 7,085 |
| Sapling & seedling | 17,401 | 181 | 1,040 | 1,951 | 4,095 | 218 | 1,232 | 1,747 |
| All stands | 54,058 | 181 | 1,040 | 2,913 | 6,824 | 4,751 | 4,133 | 8,832 |
| Oak-hickory | | | | | | | | |
| Sawtimber | 990,954 | 255 | -- | 3,057 | 7,086 | 22,062 | 55,141 | 73,719 |
| Poletimber | 912,736 | -- | 277 | -- | 2,158 | 31,305 | 72,848 | 94,836 |
| Sapling & seedling | 110,413 | 875 | 8,111 | 7,429 | 21,796 | 30,624 | 14,980 | 22,308 |
| All stands | 2,014,103 | 1,130 | 8,388 | 10,486 | 31,040 | 83,991 | 142,969 | 190,863 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 649,082 | -- | -- | 3,655 | 13,917 | 25,752 | 16,304 | 33,758 |
| Poletimber | 477,181 | -- | 1,738 | 4,151 | 11,928 | 24,411 | 7,626 | 34,802 |
| Sapling & seedling | 131,572 | 914 | 3,472 | 7,446 | 21,812 | 23,684 | 19,723 | 18,861 |
| All stands | 1,257,835 | 914 | 5,210 | 15,252 | 47,657 | 73,847 | 43,653 | 87,421 |
| Maple-birch | | | | | | | | |
| Sawtimber | 4,038,539 | -- | 1,226 | -- | 8,815 | 35,600 | 33,400 | 125,212 |
| Poletimber | 3,587,998 | -- | 890 | 4,507 | 16,053 | 36,006 | 43,385 | 142,326 |
| Sapling & seedling | 428,323 | 2,773 | 13,634 | 14,166 | 50,047 | 58,997 | 51,865 | 84,437 |
| All stands | 8,054,860 | 2,773 | 15,750 | 18,673 | 74,915 | 130,603 | 128,650 | 351,975 |
| Aspen | | | | | | | | |
| Sawtimber | 799,355 | -- | 597 | 1,109 | 7,933 | 30,847 | 15,977 | 44,781 |
| Poletimber | 1,874,948 | -- | 1,094 | 3,123 | 29,197 | 51,827 | 66,430 | 145,005 |
| Sapling & seedling | 437,565 | 4,028 | 20,671 | 37,106 | 54,103 | 89,727 | 57,248 | 67,622 |
| All stands | 3,111,868 | 4,028 | 22,362 | 41,338 | 91,233 | 172,401 | 139,655 | 257,408 |
| Paper birch | | | | | | | | |
| Sawtimber | 53,516 | -- | -- | -- | 765 | -- | 1,236 | 3,305 |
| Poletimber | 365,324 | -- | -- | -- | 1,007 | 7,074 | 11,587 | 13,742 |
| Sapling & seedling | 24,680 | 129 | 174 | 1,149 | 1,632 | 4,845 | 2,098 | 4,775 |
| All stands | 443,520 | 129 | 174 | 1,149 | 3,404 | 11,919 | 14,921 | 21,822 |
| Exotic | | | | | | | | |
| Sawtimber | 8,226 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 30,094 | -- | -- | -- | -- | -- | 1,736 | -- |
| Sapling & seedling | 7,142 | -- | 269 | 304 | 323 | 162 | -- | 1,156 |
| All stands | 45,462 | -- | 269 | 304 | 323 | 162 | 1,736 | 1,156 |
| Nonstocked | 4,000 | 900 | 2,580 | 97 | 27 | -- | -- | 312 |
| All types | | | | | | | | |
| Sawtimber | 7,956,973 | 255 | 2,442 | 11,322 | 54,715 | 142,806 | 155,843 | 341,841 |
| Poletimber | 9,638,699 | 174 | 5,040 | 18,943 | 102,154 | 211,571 | 252,495 | 533,088 |
| Sapling & seedling | 1,504,128 | 11,136 | 61,699 | 80,508 | 183,059 | 246,731 | 188,952 | 251,830 |
| Nonstocked | 4,000 | 900 | 2,580 | 97 | 27 | -- | -- | 312 |
| All stands | 19,103,800 | 12,465 | 71,761 | 110,870 | 339,955 | 601,108 | 597,290 | 1,127,071 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| stand-size class | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | 23,843 | 19,105 | 21,661 | 22,247 | -- | -- | -- |
| Poletimber | 49,280 | 33,184 | 74,991 | 64,363 | 64,016 | -- | 2,244 |
| Sapling & seedling | 8,037 | 2,500 | -- | -- | 5,041 | -- | -- |
| All stands | 81,160 | 54,789 | 96,652 | 86,610 | 69,057 | -- | 2,244 |
| Red pine | | | | | | | |
| Sawtimber | 19,819 | 11,730 | 13,275 | 29,704 | 74,576 | 31,209 | 18,122 |
| Poletimber | 46,012 | 16,739 | 16,331 | 73,510 | 76,073 | 102,974 | 74,727 |
| Sapling & seedling | 10,329 | 4,608 | -- | 1,199 | 992 | -- | -- |
| All stands | 76,160 | 33,077 | 29,606 | 104,413 | 151,641 | 134,183 | 92,849 |
| White pine | | | | | | | |
| Sawtimber | 27,331 | 17,584 | 27,675 | 60,640 | 17,189 | 83,954 | -- |
| Poletimber | 5,647 | 4,000 | 1,772 | 11,060 | 4,385 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 32,978 | 21,584 | 29,447 | 71,700 | 21,574 | 83,954 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | 15,663 | 26,153 | 73,608 | 71,436 | 7,810 | 15,337 |
| Poletimber | 32,514 | 16,472 | 37,663 | 86,169 | 72,738 | 62,047 | 24,079 |
| Sapling & seedling | 6,047 | 7,146 | 6,654 | 3,333 | 3,171 | 927 | -- |
| All stands | 38,561 | 39,281 | 70,470 | 163,110 | 147,345 | 70,784 | 39,416 |
| White spruce | | | | | | | |
| Sawtimber | 1,806 | 1,939 | 3,766 | 11,359 | 10,665 | 6,256 | 8,990 |
| Poletimber | 3,448 | 5,787 | 7,474 | 5,050 | 25,679 | 4,565 | 3,159 |
| Sapling & seedling | 2,336 | -- | -- | 1,234 | -- | -- | -- |
| All stands | 7,590 | 7,726 | 11,240 | 17,643 | 36,344 | 10,821 | 12,149 |
| Black spruce | | | | | | | |
| Sawtimber | 4,358 | 1,529 | -- | 1,618 | 8,830 | -- | -- |
| Poletimber | 8,021 | 9,790 | 27,322 | 82,011 | 40,656 | 14,358 | 15,958 |
| Sapling & seedling | 6,759 | 3,537 | 7,591 | 5,259 | 2,200 | -- | -- |
| All stands | 19,138 | 14,856 | 34,913 | 88,888 | 51,686 | 14,358 | 15,958 |
| Northern white-cedar | | | | | | | |
| Sawtimber | 7,521 | -- | 19,388 | 88,636 | 91,448 | 113,702 | 157,171 |
| Poletimber | 14,173 | 15,196 | 27,027 | 81,877 | 198,750 | 195,079 | 276,138 |
| Sapling & seedling | 9,743 | 4,978 | 5,925 | 15,603 | 20,395 | 12,535 | 977 |
| All stands | 31,437 | 20,174 | 52,340 | 186,116 | 310,593 | 321,316 | 434,286 |

(Table 38 continued on next page)

(Table 38 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | |
| Sawtimber | 2,977 | -- | -- | -- | 1,956 | -- | -- |
| Poletimber | 3,337 | 5,269 | 3,058 | 1,850 | -- | -- | -- |
| Sapling & seedling | 3,205 | 2,358 | 384 | -- | 990 | -- | -- |
| All stands | 9,519 | 7,627 | 3,442 | 1,850 | 2,946 | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 107,495 | 114,464 | 107,768 | 223,481 | 226,662 | 49,764 | -- |
| Poletimber | 123,920 | 108,713 | 133,035 | 189,381 | 110,137 | 26,246 | 19,880 |
| Sapling & seedling | 1,015 | 764 | 1,394 | 1,117 | -- | -- | -- |
| All stands | 232,430 | 223,941 | 242,197 | 413,979 | 336,799 | 76,010 | 19,880 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 67,783 | 35,523 | 30,781 | 128,938 | 194,241 | 84,087 | 14,343 |
| Poletimber | 56,797 | 25,492 | 100,472 | 67,240 | 81,191 | 54,604 | 6,729 |
| Sapling & seedling | 16,348 | 1,680 | 10,441 | 4,906 | 2,285 | -- | -- |
| All stands | 140,928 | 62,695 | 141,694 | 201,084 | 277,717 | 138,691 | 21,072 |
| Maple-birch | | | | | | | |
| Sawtimber | 257,458 | 216,101 | 488,271 | 870,610 | 1,320,863 | 500,924 | 180,059 |
| Poletimber | 231,336 | 234,968 | 423,831 | 859,513 | 1,132,279 | 417,909 | 44,995 |
| Sapling & seedling | 49,294 | 43,348 | 26,651 | 26,333 | 6,778 | -- | -- |
| All stands | 538,088 | 494,417 | 938,753 | 1,756,456 | 2,459,920 | 918,833 | 225,054 |
| Aspen | | | | | | | |
| Sawtimber | 68,009 | 54,658 | 89,495 | 103,810 | 216,115 | 102,651 | 63,373 |
| Poletimber | 163,464 | 172,970 | 260,517 | 277,124 | 412,698 | 220,337 | 71,162 |
| Sapling & seedling | 36,454 | 14,191 | 28,544 | 15,936 | 11,935 | -- | -- |
| All stands | 267,927 | 241,819 | 378,556 | 396,870 | 640,748 | 322,988 | 134,535 |
| Paper birch | | | | | | | |
| Sawtimber | -- | 1,886 | 4,938 | 13,638 | 22,597 | -- | 5,151 |
| Poletimber | 24,483 | 11,539 | 56,423 | 58,522 | 135,897 | 36,749 | 8,301 |
| Sapling & seedling | 1,934 | 3,644 | 2,176 | 2,124 | -- | -- | -- |
| All stands | 26,417 | 17,069 | 63,537 | 74,284 | 158,494 | 36,749 | 13,452 |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | 8,226 | -- | -- | -- |
| Poletimber | 1,327 | 1,665 | 5,610 | 9,426 | 5,447 | 4,883 | -- |
| Sapling & seedling | 3,372 | -- | 1,133 | -- | 423 | -- | -- |
| All stands | 4,699 | 1,665 | 6,743 | 17,652 | 5,870 | 4,883 | -- |
| Nonstocked | 84 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 588,400 | 490,182 | 833,171 | 1,636,515 | 2,256,578 | 980,357 | 462,546 |
| Poletimber | 763,759 | 661,784 | 1,175,526 | 1,867,096 | 2,359,946 | 1,139,751 | 547,372 |
| Sapling & seedling | 154,873 | 88,754 | 90,893 | 77,044 | 54,210 | 13,462 | 977 |
| Nonstocked | 84 | -- | -- | -- | -- | -- | -- |
| All stands | 1,507,116 | 1,240,720 | 2,099,590 | 3,580,655 | 4,670,734 | 2,133,570 | 1,010,895 |

Table 39.--Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Michigan, 1980

(In thousand board feet)[1]

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
|---|---|---|---|---|---|---|---|---|
| Jack pine | | | | | | | | |
| Sawtimber | 565,568 | -- | -- | 7,462 | 16,816 | 56,434 | 76,081 | 103,591 |
| Poletimber | 657,940 | -- | 2,399 | 11,564 | 14,819 | 105,876 | 41,274 | 78,844 |
| Sapling & seedling | 104,680 | 1,436 | 6,397 | 2,302 | 17,307 | 17,389 | 17,132 | 29,289 |
| All stands | 1,328,188 | 1,436 | 8,796 | 21,328 | 48,942 | 179,699 | 134,487 | 211,724 |
| Red pine | | | | | | | | |
| Sawtimber | 899,007 | -- | 3,362 | -- | 18,961 | 25,661 | 6,944 | 49,333 |
| Poletimber | 567,799 | -- | -- | -- | 3,141 | 7,891 | 12,169 | 12,992 |
| Sapling & seedling | 61,110 | 3,862 | 836 | 4,257 | -- | 803 | 26,198 | 12,755 |
| All stands | 1,527,916 | 3,862 | 4,198 | 4,257 | 22,102 | 34,355 | 45,311 | 75,080 |
| White pine | | | | | | | | |
| Sawtimber | 1,044,586 | -- | -- | 2,609 | 12,531 | 12,212 | 9,674 | 46,156 |
| Poletimber | 64,319 | -- | -- | -- | -- | 8,808 | 4,870 | 5,307 |
| Sapling & seedling | 41,407 | 1,545 | 4,020 | 7,551 | 4,205 | 2,858 | 11,851 | 9,377 |
| All stands | 1,150,312 | 1,545 | 4,020 | 10,160 | 16,736 | 23,878 | 26,395 | 60,840 |
| Balsam fir | | | | | | | | |
| Sawtimber | 722,252 | -- | -- | -- | -- | -- | 27,042 | 6,462 |
| Poletimber | 650,408 | -- | -- | 584 | 2,084 | 7,905 | 5,788 | 43,449 |
| Sapling & seedling | 117,873 | 360 | 2,870 | 8,631 | 17,311 | 22,274 | 9,553 | 15,479 |
| All stands | 1,490,533 | 360 | 2,870 | 9,215 | 19,395 | 30,179 | 42,383 | 65,390 |
| White spruce | | | | | | | | |
| Sawtimber | 164,795 | -- | -- | -- | 2,163 | 6,391 | -- | 8,225 |
| Poletimber | 84,474 | -- | -- | -- | -- | 1,977 | -- | 538 |
| Sapling & seedling | 24,112 | -- | 1,278 | 2,243 | 1,466 | 5,783 | 1,253 | 4,170 |
| All stands | 273,381 | -- | 1,278 | 2,243 | 3,629 | 14,151 | 1,253 | 12,933 |
| Black spruce | | | | | | | | |
| Sawtimber | 56,719 | -- | -- | -- | -- | -- | 5,380 | -- |
| Poletimber | 366,163 | -- | -- | 1,378 | 74,612 | 5,200 | 11,548 | 15,079 |
| Sapling & seedling | 87,192 | 1,255 | 9,928 | -- | 9,471 | 16,271 | 7,789 | 12,599 |
| All stands | 510,074 | 1,255 | 9,928 | 1,378 | 84,083 | 21,471 | 24,717 | 27,678 |
| Northern white-cedar | | | | | | | | |
| Sawtimber | 1,561,526 | -- | -- | -- | 10,196 | 4,605 | 13,792 | 21,674 |
| Poletimber | 1,010,917 | -- | -- | -- | 3,309 | 1,357 | 1,989 | 10,361 |
| Sapling & seedling | 87,066 | -- | 1,175 | 2,438 | 1,850 | 4,121 | 3,557 | 8,062 |
| All stands | 2,659,509 | -- | 1,175 | 2,438 | 15,355 | 10,083 | 19,338 | 40,097 |

(Table 39 continued on next page)

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[1] International 1/4-inch rule.

(Table 39 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 |
| Tamarack | | | | | | | | |
| Sawtimber | 28,761 | -- | -- | 4,381 | 2,822 | 7,818 | -- | -- |
| Poletimber | 39,715 | -- | -- | -- | 1,272 | 2,366 | 5,747 | 7,031 |
| Sapling & seedling | 24,508 | -- | 4,174 | 1,986 | 5,860 | -- | 2,549 | 4,556 |
| All stands | 92,984 | -- | 4,174 | 6,367 | 9,954 | 10,184 | 8,296 | 11,587 |
| Oak-hickory | | | | | | | | |
| Sawtimber | 3,916,254 | 1,467 | -- | 12,313 | 30,916 | 82,351 | 244,510 | 299,502 |
| Poletimber | 1,535,137 | -- | 493 | -- | 839 | 47,061 | 122,699 | 173,377 |
| Sapling & seedling | 310,946 | 3,086 | 18,539 | 11,521 | 63,789 | 102,620 | 31,059 | 70,999 |
| All stands | 5,762,337 | 4,553 | 19,032 | 23,834 | 95,544 | 232,032 | 398,268 | 543,878 |
| Elm-ash-soft maple | | | | | | | | |
| Sawtimber | 2,380,406 | -- | -- | 14,632 | 54,896 | 96,719 | 55,046 | 128,525 |
| Poletimber | 831,808 | -- | 2,645 | 4,690 | 21,179 | 39,496 | 13,139 | 58,568 |
| Sapling & seedling | 249,767 | 2,306 | 7,530 | 14,949 | 37,010 | 55,662 | 20,846 | 38,543 |
| All stands | 3,461,981 | 2,306 | 10,175 | 34,271 | 113,085 | 191,877 | 89,031 | 225,636 |
| Maple-birch | | | | | | | | |
| Sawtimber | 15,379,590 | -- | 4,671 | -- | 37,486 | 150,161 | 130,721 | 479,602 |
| Poletimber | 6,277,708 | -- | 555 | 4,511 | 15,559 | 62,775 | 67,950 | 252,140 |
| Sapling & seedling | 1,001,430 | 9,694 | 32,703 | 32,821 | 103,752 | 125,833 | 108,475 | 181,976 |
| All stands | 22,658,728 | 9,694 | 37,929 | 37,332 | 156,797 | 338,769 | 307,146 | 913,718 |
| Aspen | | | | | | | | |
| Sawtimber | 2,624,567 | -- | 2,224 | 3,216 | 30,675 | 124,739 | 54,326 | 166,293 |
| Poletimber | 2,766,926 | -- | 698 | 3,951 | 38,025 | 59,138 | 85,645 | 216,637 |
| Sapling & seedling | 695,720 | 12,854 | 34,946 | 61,708 | 88,434 | 160,232 | 108,817 | 89,672 |
| All stands | 6,087,213 | 12,854 | 37,868 | 68,875 | 157,134 | 344,109 | 248,788 | 472,602 |
| Paper birch | | | | | | | | |
| Sawtimber | 148,584 | -- | -- | -- | 2,932 | -- | 3,865 | 9,276 |
| Poletimber | 423,382 | -- | -- | -- | 2,792 | 10,726 | 9,907 | 18,819 |
| Sapling & seedling | 28,465 | 574 | -- | 2,463 | 1,458 | 6,405 | 3,864 | 7,435 |
| All stands | 600,431 | 574 | -- | 2,463 | 7,182 | 17,131 | 17,636 | 35,530 |
| Exotic | | | | | | | | |
| Sawtimber | 35,326 | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 15,785 | -- | -- | -- | -- | -- | 2,176 | -- |
| Sapling & seedling | 5,365 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 56,476 | -- | -- | -- | -- | -- | 2,176 | -- |
| Nonstocked | 9,073 | 158 | 8,695 | -- | -- | -- | -- | -- |
| All types | | | | | | | | |
| Sawtimber | 29,527,941 | 1,467 | 10,257 | 44,613 | 220,394 | 567,091 | 627,381 | 1,318,639 |
| Poletimber | 15,292,481 | -- | 6,790 | 26,678 | 177,631 | 360,576 | 384,901 | 893,142 |
| Sapling & seedling | 2,839,641 | 36,972 | 124,396 | 152,870 | 351,913 | 520,251 | 352,943 | 484,912 |
| Nonstocked | 9,073 | 158 | 8,695 | -- | -- | -- | -- | -- |
| All stands | 47,669,136 | 38,597 | 150,138 | 224,161 | 749,938 | 1,447,918 | 1,365,225 | 2,696,693 |

(Table 39 continued on next page

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | |
| Sawtimber | 88,405 | 67,664 | 81,033 | 68,082 | -- | -- | -- |
| Poletimber | 86,242 | 46,099 | 136,337 | 53,283 | 80,249 | -- | 954 |
| Sapling & seedling | 11,855 | 1,573 | -- | -- | -- | -- | -- |
| All stands | 186,502 | 115,336 | 217,370 | 121,365 | 80,249 | -- | 954 |
| Red pine | | | | | | | |
| Sawtimber | 88,986 | 43,477 | 53,846 | 123,381 | 295,193 | 109,671 | 80,192 |
| Poletimber | 82,651 | 11,560 | 4,181 | 102,408 | 93,201 | 154,172 | 83,433 |
| Sapling & seedling | -- | 12,399 | -- | -- | -- | -- | -- |
| All stands | 171,637 | 67,436 | 58,027 | 225,789 | 388,394 | 263,843 | 163,625 |
| White pine | | | | | | | |
| Sawtimber | 121,957 | 80,243 | 113,621 | 267,393 | 61,562 | 316,628 | -- |
| Poletimber | 12,024 | 6,138 | 4,454 | 21,772 | 946 | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- |
| All stands | 133,981 | 86,381 | 118,075 | 289,165 | 62,508 | 316,628 | -- |
| Balsam fir | | | | | | | |
| Sawtimber | -- | 50,556 | 89,116 | 259,683 | 216,223 | 23,387 | 49,783 |
| Poletimber | 60,909 | 22,045 | 64,121 | 160,729 | 116,412 | 130,044 | 36,338 |
| Sapling & seedling | 8,320 | 12,877 | 10,850 | 3,636 | 5,712 | -- | -- |
| All stands | 69,229 | 85,478 | 164,087 | 424,048 | 338,347 | 153,431 | 86,121 |
| White spruce | | | | | | | |
| Sawtimber | 5,909 | 5,942 | 11,650 | 34,692 | 37,877 | 23,909 | 28,037 |
| Poletimber | 3,243 | 8,089 | 17,577 | 10,788 | 26,841 | 9,233 | 6,188 |
| Sapling & seedling | 7,919 | -- | -- | -- | -- | -- | -- |
| All stands | 17,071 | 14,031 | 29,227 | 45,480 | 64,718 | 33,142 | 34,225 |
| Black spruce | | | | | | | |
| Sawtimber | 13,234 | 4,931 | -- | 5,010 | 28,164 | -- | -- |
| Poletimber | 13,439 | 7,051 | 41,258 | 83,931 | 51,934 | 27,321 | 33,412 |
| Sapling & seedling | 6,631 | 8,097 | 11,101 | 1,819 | 2,231 | -- | -- |
| All stands | 33,304 | 20,079 | 52,359 | 90,760 | 82,329 | 27,321 | 33,412 |
| Northern white-cedar | | | | | | | |
| Sawtimber | 26,032 | -- | 70,056 | 292,098 | 297,544 | 338,872 | 486,657 |
| Poletimber | 17,905 | 19,854 | 33,466 | 108,187 | 250,569 | 239,400 | 324,520 |
| Sapling & seedling | 8,903 | 9,725 | 3,660 | 21,062 | 13,358 | 7,870 | 1,285 |
| All stands | 52,840 | 29,579 | 107,182 | 421,347 | 561,471 | 586,142 | 812,462 |

(Table 39 continued on next page)

(Table 39 continued)

| Forest type and stand-size class | Basal-area class (square feet per acre) 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|
| Tamarack | | | | | | | |
| Sawtimber | 7,709 | -- | -- | -- | 6,031 | -- | -- |
| Poletimber | 5,862 | 10,894 | 3,174 | 3,369 | -- | -- | -- |
| Sapling & seedling | 1,016 | 3,057 | -- | -- | 1,310 | -- | -- |
| All stands | 14,587 | 13,951 | 3,174 | 3,369 | 7,341 | -- | -- |
| Oak-hickory | | | | | | | |
| Sawtimber | 440,653 | 440,446 | 407,294 | 860,106 | 894,092 | 202,604 | -- |
| Poletimber | 226,828 | 193,518 | 194,792 | 330,986 | 174,966 | 39,610 | 29,968 |
| Sapling & seedling | 1,825 | 1,085 | 4,345 | 2,078 | -- | -- | -- |
| All stands | 669,306 | 635,049 | 606,431 | 1,193,170 | 1,069,058 | 242,214 | 29,968 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 238,498 | 143,601 | 143,651 | 488,570 | 697,577 | 271,157 | 47,534 |
| Poletimber | 101,528 | 54,451 | 167,813 | 122,620 | 142,492 | 94,058 | 9,129 |
| Sapling & seedling | 44,608 | 1,246 | 17,515 | 6,203 | 3,349 | -- | -- |
| All stands | 384,634 | 199,298 | 328,979 | 617,393 | 843,418 | 365,215 | 56,663 |
| Maple-birch | | | | | | | |
| Sawtimber | 1,011,334 | 840,695 | 1,850,071 | 3,267,339 | 5,037,120 | 1,845,429 | 724,961 |
| Poletimber | 412,043 | 419,085 | 734,211 | 1,489,505 | 1,997,049 | 751,708 | 70,617 |
| Sapling & seedling | 137,413 | 107,944 | 74,609 | 76,171 | 10,039 | -- | -- |
| All stands | 1,560,790 | 1,367,724 | 2,658,891 | 4,833,015 | 7,044,208 | 2,597,137 | 795,578 |
| Aspen | | | | | | | |
| Sawtimber | 225,450 | 183,154 | 288,768 | 338,059 | 711,149 | 311,577 | 184,937 |
| Poletimber | 221,533 | 291,090 | 353,370 | 452,867 | 639,785 | 270,166 | 134,021 |
| Sapling & seedling | 53,704 | 28,197 | 29,694 | 20,018 | 7,444 | -- | -- |
| All stands | 500,687 | 502,441 | 671,832 | 810,944 | 1,358,378 | 581,743 | 318,958 |
| Paper birch | | | | | | | |
| Sawtimber | -- | 6,127 | 14,179 | 37,210 | 57,139 | -- | 17,856 |
| Poletimber | 26,982 | 8,511 | 60,107 | 66,713 | 155,682 | 55,906 | 7,237 |
| Sapling & seedling | 1,959 | 2,845 | -- | 1,462 | -- | -- | -- |
| All stands | 28,941 | 17,483 | 74,286 | 105,385 | 212,821 | 55,906 | 25,093 |
| Exotic | | | | | | | |
| Sawtimber | -- | -- | -- | 35,326 | -- | -- | -- |
| Poletimber | 3,134 | -- | 1,621 | 6,536 | 1,599 | 719 | -- |
| Sapling & seedling | 2,527 | -- | 2,838 | -- | -- | -- | -- |
| All stands | 5,661 | -- | 4,459 | 41,862 | 1,599 | 719 | -- |
| Nonstocked | 220 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | |
| Sawtimber | 2,268,167 | 1,866,836 | 3,123,285 | 6,076,949 | 8,339,671 | 3,443,234 | 1,619,957 |
| Poletimber | 1,274,323 | 1,098,385 | 1,816,482 | 3,013,694 | 3,731,725 | 1,772,337 | 735,817 |
| Sapling & seedling | 286,680 | 189,045 | 154,612 | 132,449 | 43,443 | 7,870 | 1,285 |
| Nonstocked | 220 | -- | -- | -- | -- | -- | -- |
| All stands | 3,829,390 | 3,154,266 | 5,094,379 | 9,223,092 | 12,114,839 | 5,223,441 | 2,357,059 |

## Table 40.--Net volume of sawtimber on commercial forest land by species group and log-grade, Michigan, 1980

(In thousand board feet)[1]

| Species group | All grades | Log grade 1 | Log grade 2 | Log grade 3 | Tie and timber |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| White pine | 2,606,707 | 174,297 | 297,188 | 1,664,999 | 470,223 |
| Red pine | 1,890,783 | 52,174 | 47,663 | 1,717,109 | 73,837 |
| Jack pine | 1,300,487 | 699 | 23,243 | 1,266,563 | 9,982 |
| White spruce | 1,395,518 | -- | 60,704 | 1,334,814 | -- |
| Black spruce | 364,731 | 794 | 2,810 | 361,127 | -- |
| Balsam fir | 1,086,763 | 3,018 | 915 | 1,050,501 | 32,329 |
| Hemlock | 2,389,793 | 45,092 | 177,649 | 2,139,378 | 27,674 |
| Tamarack | 191,493 | 5,901 | 9,144 | 176,448 | -- |
| Northern white-cedar | 2,648,562 | 24,300 | 52,827 | 2,571,435 | -- |
| Other softwoods | 70,682 | -- | -- | 70,682 | -- |
| Total | 13,945,519 | 306,275 | 672,143 | 12,353,056 | 614,045 |
| HARDWOODS | | | | | |
| Select white oaks | 1,791,072 | 111,280 | 370,165 | 1,008,281 | 301,346 |
| Select red oaks | 3,903,389 | 263,367 | 851,413 | 2,233,453 | 555,156 |
| Other red oaks | 931,164 | 61,896 | 139,542 | 564,605 | 165,121 |
| Hickory | 331,572 | 11,075 | 73,422 | 209,468 | 37,607 |
| Yellow birch | 1,516,165 | 164,035 | 457,493 | 796,756 | 97,881 |
| Hard maple | 6,997,860 | 790,783 | 1,920,403 | 3,828,055 | 458,619 |
| Soft maple | 4,813,226 | 463,448 | 999,884 | 3,099,249 | 250,645 |
| Beech | 1,240,413 | 54,024 | 192,087 | 863,499 | 130,803 |
| Ash | 1,469,167 | 208,719 | 362,792 | 839,345 | 58,311 |
| Balsam poplar | 811,808 | 51,942 | 127,832 | 527,115 | 104,919 |
| Cottonwood | 291,306 | 53,582 | 50,377 | 179,926 | 7,421 |
| Bigtooth aspen | 1,842,998 | 41,419 | 335,989 | 1,345,127 | 120,463 |
| Quaking aspen | 3,460,407 | 78,242 | 417,725 | 2,481,202 | 483,238 |
| Basswood | 1,772,955 | 278,489 | 551,132 | 888,553 | 54,781 |
| Yellow-poplar | 87,069 | 25,987 | 20,980 | 38,059 | 2,043 |
| Black walnut | 84,707 | 4,713 | 1,043 | 67,999 | 10,952 |
| Black cherry | 593,837 | 36,257 | 3,463 | 479,208 | 74,909 |
| Butternut | 8,952 | -- | -- | 8,952 | -- |
| Elm | 632,956 | 63,207 | 233,541 | 274,999 | 61,209 |
| Paper birch | 910,295 | 17,662 | 126,164 | 690,637 | 75,832 |
| Other hardwoods | 232,299 | 14,443 | 29,848 | 153,757 | 34,251 |
| Total | 33,723,617 | 2,794,570 | 7,265,295 | 20,578,245 | 3,085,507 |
| All species | 47,669,136 | 3,100,845 | 7,937,438 | 32,931,301 | 3,699,552 |

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[1] International 1/4-inch rule.

Table 41.--Net volume of short-log trees on commercial forest land by species group and diameter class, Michigan, 1980

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 4,499 | 1,538 | 1,198 | 556 | 410 | 163 | 146 | 75 | 413 | -- | -- |
| Red pine | 696 | 370 | 224 | -- | -- | 102 | -- | -- | -- | -- | -- |
| Jack pine | 3,797 | 2,289 | 504 | 622 | 194 | 188 | -- | -- | -- | -- | -- |
| White spruce | 1,592 | 798 | 222 | 251 | -- | 226 | 95 | -- | -- | -- | -- |
| Black spruce | 360 | 284 | 76 | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 2,743 | 1,153 | 1,088 | 199 | -- | 303 | -- | -- | -- | -- | -- |
| Hemlock | 12,079 | 3,549 | 2,349 | 1,966 | 1,083 | 1,178 | 722 | 581 | 530 | 121 | -- |
| Tamarack | 515 | 395 | 60 | -- | 60 | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 31,451 | 9,687 | 7,752 | 4,720 | 3,203 | 1,967 | 1,618 | 912 | 1,371 | 221 | -- |
| Other softwoods | 382 | 227 | 155 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 58,114 | 20,290 | 13,628 | 8,314 | 4,950 | 4,127 | 2,581 | 1,568 | 2,314 | 342 | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 7,988 | -- | 2,484 | 1,885 | 655 | -- | 713 | 290 | 1,447 | 514 | -- |
| Select red oaks | 16,310 | -- | 4,577 | 2,945 | 1,617 | 1,991 | 1,693 | 1,543 | 1,211 | 733 | -- |
| Other red oaks | 3,756 | -- | 1,283 | 588 | 456 | 365 | 64 | -- | 470 | 530 | -- |
| Hickory | 1,155 | -- | 172 | 283 | 250 | 202 | -- | 248 | -- | -- | -- |
| Yellow birch | 28,097 | -- | 5,149 | 3,923 | 4,624 | 2,599 | 3,195 | 1,754 | 3,863 | 2,990 | -- |
| Hard maple | 53,500 | -- | 14,878 | 8,901 | 6,951 | 6,222 | 4,708 | 2,068 | 6,669 | 2,818 | 285 |
| Soft maple | 35,290 | -- | 10,724 | 6,464 | 7,034 | 3,205 | 1,773 | 2,035 | 2,646 | 801 | 608 |
| Beech | 14,704 | -- | 2,118 | 2,832 | 1,336 | 1,780 | 1,516 | 1,696 | 2,817 | 609 | -- |
| Ash | 7,712 | -- | 2,692 | 1,624 | 785 | 751 | 207 | 569 | 792 | -- | 292 |
| Balsam poplar | 1,692 | -- | 984 | 129 | 229 | 183 | 167 | -- | -- | -- | -- |
| Cottonwood | 92 | -- | -- | -- | -- | -- | -- | 92 | -- | -- | -- |
| Bigtooth aspen | 8,057 | -- | 3,096 | 1,983 | 1,281 | 761 | 369 | 319 | 248 | -- | -- |
| Quaking aspen | 21,989 | -- | 8,781 | 5,393 | 4,223 | 1,899 | 959 | 639 | 95 | -- | -- |
| Basswood | 6,135 | -- | 2,065 | 1,105 | 1,076 | 484 | 530 | 629 | 114 | 132 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 288 | -- | -- | -- | -- | -- | -- | -- | -- | 288 | -- |
| Black cherry | 6,054 | -- | 3,077 | 1,012 | 1,017 | 674 | 274 | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 4,825 | -- | 2,144 | 1,389 | 106 | 597 | 388 | -- | 201 | -- | -- |
| Paper birch | 8,451 | -- | 4,437 | 1,377 | 861 | 617 | 712 | 281 | 87 | 79 | -- |
| Other hardwoods | 2,221 | -- | 646 | 660 | 102 | 142 | -- | -- | -- | 334 | 337 |
| Total | 228,316 | -- | 69,307 | 42,493 | 32,603 | 22,472 | 17,268 | 12,163 | 20,660 | 9,828 | 1,522 |
| All species | 286,430 | 20,290 | 82,935 | 50,807 | 37,553 | 26,599 | 19,849 | 13,731 | 22,974 | 10,170 | 1,522 |

Table 42.--Net volume of short-log trees on commercial forest land by species group and diameter class, Michighan, 1980

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0 10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| White pine | 17,892 | 7,565 | 4,658 | 1,967 | 1,396 | 502 | 560 | 180 | 1,064 | -- | -- |
| Red pine | 2,871 | 1,631 | 938 | -- | -- | 302 | -- | -- | -- | -- | -- |
| Jack pine | 16,843 | 11,455 | 1,988 | 2,229 | 753 | 418 | -- | -- | -- | -- | -- |
| White spruce | 6,356 | 3,737 | 845 | 821 | -- | 676 | 277 | -- | -- | -- | -- |
| Black spruce | 1,590 | 1,177 | 413 | -- | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 10,037 | 4,819 | 3,989 | 700 | -- | 529 | -- | -- | -- | -- | -- |
| Hemlock | 44,323 | 15,008 | 9,187 | 6,997 | 3,426 | 3,659 | 2,749 | 1,664 | 1,374 | 259 | -- |
| Tamarack | 2,409 | 1,921 | 302 | -- | 186 | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 92,977 | 37,606 | 24,852 | 12,557 | 7,373 | 3,706 | 3,156 | 1,590 | 1,953 | 184 | -- |
| Other softwoods | 2,188 | 1,321 | 867 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 197,486 | 86,240 | 48,039 | 25,271 | 13,134 | 9,792 | 6,742 | 3,434 | 4,391 | 443 | -- |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 22,490 | -- | 6,956 | 5,455 | 1,798 | -- | 1,949 | 910 | 3,672 | 1,750 | -- |
| Select red oaks | 46,701 | -- | 13,910 | 8,407 | 4,561 | 5,331 | 4,932 | 4,370 | 3,483 | 1,707 | -- |
| Other red oaks | 11,314 | -- | 4,371 | 1,715 | 1,283 | 1,049 | 184 | -- | 1,362 | 1,350 | -- |
| Hickory | 3,635 | -- | 1,062 | 797 | 282 | 791 | -- | 703 | -- | -- | -- |
| Yellow birch | 116,473 | -- | 28,660 | 19,776 | 20,096 | 10,544 | 11,984 | 7,156 | 10,380 | 7,877 | -- |
| Hard maple | 139,365 | -- | 41,298 | 26,167 | 19,234 | 18,036 | 10,888 | 4,466 | 13,907 | 4,913 | 456 |
| Soft maple | 106,265 | -- | 32,483 | 18,450 | 20,650 | 9,544 | 5,648 | 6,652 | 8,014 | 2,431 | 2,393 |
| Beech | 40,524 | -- | 5,247 | 7,457 | 3,480 | 4,966 | 4,200 | 4,795 | 8,026 | 2,353 | -- |
| Ash | 20,333 | -- | 7,670 | 3,991 | 1,798 | 2,159 | 587 | 2,045 | 1,554 | -- | 529 |
| Balsam poplar | 4,286 | -- | 2,493 | 197 | 641 | 440 | 515 | -- | -- | -- | -- |
| Cottonwood | 337 | -- | -- | -- | -- | -- | -- | 337 | -- | -- | -- |
| Bigtooth aspen | 19,855 | -- | 8,633 | 4,629 | 2,963 | 1,784 | 732 | 671 | 443 | -- | -- |
| Quaking aspen | 58,989 | -- | 24,893 | 14,478 | 10,695 | 4,768 | 2,751 | 1,251 | 153 | -- | -- |
| Basswood | 17,449 | -- | 5,530 | 2,882 | 3,472 | 1,216 | 1,155 | 2,470 | 343 | 381 | -- |
| Yellow-poplar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 246 | -- | -- | -- | -- | -- | -- | -- | -- | 246 | -- |
| Black cherry | 16,980 | -- | 9,377 | 2,392 | 2,494 | 1,905 | 812 | -- | -- | -- | -- |
| Butternut | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 14,330 | -- | 6,812 | 3,710 | 300 | 1,791 | 1,112 | -- | 605 | -- | -- |
| Paper birch | 24,789 | -- | 11,854 | 3,993 | 2,601 | 2,224 | 2,521 | 893 | 404 | 299 | -- |
| Other hardwoods | 5,681 | -- | 2,173 | 1,444 | 162 | 379 | -- | -- | -- | 759 | 764 |
| Total | 670,042 | -- | 213,422 | 125,940 | 96,510 | 66,927 | 49,970 | 36,719 | 52,346 | 24,066 | 4,142 |
| All species | 867,528 | 86,240 | 261,461 | 151,211 | 109,644 | 76,719 | 56,712 | 40,153 | 56,737 | 24,509 | 4,142 |

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[1] International 1/4-inch rule.

Table 43.--Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, Michigan 1965 and 1979

(In million cubic feet)

| Species | [1]1965 | 1979 |
|---|---|---|
| Softwoods | 141.0 | 205.5 |
| Hardwoods | 363.7 | 472.3 |
| All species | 504.7 | 677.8 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 44.--Net annual growth of growing stock on commercial forest land by species group and Forest Survey Unit, Michigan, 1979

(In thousand cubic feet)

| Species group | All Units | Forest Survey Unit | | | |
|---|---|---|---|---|---|
| | | Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
| SOFTWOODS | | | | | |
| White pine | 19,345 | 4,426 | 4,794 | 7,359 | 2,766 |
| Red pine | 44,857 | 6,437 | 3,030 | 32,209 | 3,181 |
| Jack pine | 26,700 | 7,527 | 3,999 | 14,588 | 586 |
| White spruce | 23,053 | 7,252 | 12,811 | 2,483 | 507 |
| Black spruce | 12,587 | 6,570 | 4,936 | 1,081 | -- |
| Balsam fir | 24,608 | 6,263 | 16,748 | 1,591 | 6 |
| Hemlock | 10,814 | 3,090 | 6,260 | 1,360 | 104 |
| Tamarack | 161 | 849 | 841 | -1,568 | 39 |
| Northern white-cedar | 39,369 | 17,080 | 7,331 | 14,711 | 247 |
| Other softwoods | 3,977 | 51 | 86 | 2,584 | 1,256 |
| Total | 205,471 | 59,545 | 60,836 | 76,398 | 8,692 |
| HARDWOODS | | | | | |
| Select white oaks | 12,566 | 12 | 17 | 5,645 | 6,892 |
| Select red oaks | 33,886 | 816 | 2,599 | 21,281 | 9,190 |
| Other red oaks | 8,388 | -- | -- | 4,565 | 3,823 |
| Hickory | 2,871 | -- | -- | 50 | 2,821 |
| Yellow birch | 9,329 | 1,621 | 6,723 | 799 | 186 |
| Hard maple | 94,457 | 18,589 | 49,016 | 23,690 | 3,162 |
| Soft maple | 113,426 | 20,833 | 31,444 | 42,752 | 18,397 |
| Beech | 6,163 | 4,169 | 11 | 1,378 | 605 |
| Ash | 39,045 | 6,172 | 7,914 | 13,059 | 11,900 |
| Balsam poplar | 4,481 | 2,093 | 917 | 1,226 | 245 |
| Cottonwood | 2,500 | 15 | 6 | 322 | 2,157 |
| Bigtooth aspen | 36,330 | 1,956 | 2,295 | 28,441 | 3,638 |
| Quaking aspen | 52,163 | 10,834 | 15,664 | 20,759 | 4,906 |
| Basswood | 22,318 | 2,020 | 7,530 | 9,876 | 2,892 |
| Yellow-poplar | 400 | -- | -- | -- | 400 |
| Black walnut | 796 | -- | -- | 3 | 793 |
| Black cherry | 16,830 | 1,989 | 2,109 | 5,876 | 6,856 |
| Butternut | 99 | -- | -- | 7 | 92 |
| Elm | -12,374 | -5,230 | -1,291 | -2,502 | -3,351 |
| Paper birch | 25,532 | 6,791 | 8,873 | 9,155 | 713 |
| Other hardwoods | 3,080 | 10 | 8 | 267 | 2,795 |
| Total | 472,286 | 72,690 | 133,835 | 186,649 | 79,112 |
| All species | 677,757 | 132,235 | 194,671 | 263,047 | 87,804 |

## Table 45.--Net annual growth of sawtimber on commercial forest land by species group and Forest Survey Unit, Michigan, 1979

(In thousand board feet)[1]

| Species group | All Units | Forest Survey Unit | | | |
|---|---|---|---|---|---|
| | | Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
| SOFTWOODS | | | | | |
| White pine | 108,617 | 25,973 | 25,759 | 39,030 | 17,855 |
| Red pine | 117,205 | 23,613 | 12,329 | 73,439 | 7,824 |
| Jack pine | 104,334 | 23,253 | 21,954 | 56,093 | 3,034 |
| White spruce | 95,051 | 33,520 | 53,710 | 7,748 | 73 |
| Black spruce | 10,896 | 5,452 | 5,499 | -55 | -- |
| Balsam fir | 66,895 | 15,119 | 44,394 | 7,348 | 34 |
| Hemlock | 63,350 | 19,709 | 37,543 | 5,597 | 501 |
| Tamarack | 5,070 | 3,203 | 3,722 | -1,882 | 27 |
| Northern white-cedar | 105,695 | 40,382 | 32,141 | 32,964 | 208 |
| Other softwoods | 9,741 | 387 | 8 | 4,288 | 5,058 |
| Total | 686,854 | 190,611 | 237,059 | 224,570 | 34,614 |
| HARDWOODS | | | | | |
| Select white oaks | 68,022 | 22 | 104 | 25,985 | 41,911 |
| Select red oaks | 186,674 | 2,758 | 15,496 | 113,864 | 54,556 |
| Other red oaks | 36,495 | -- | -- | 17,573 | 18,922 |
| Hickory | 15,022 | -- | -- | 128 | 14,894 |
| Yellow birch | 32,273 | 8,178 | 19,639 | 3,846 | 610 |
| Hard maple | 288,837 | 65,882 | 139,326 | 69,970 | 13,659 |
| Soft maple | 301,091 | 55,522 | 79,450 | 109,124 | 56,995 |
| Beech | 24,013 | 18,805 | 8 | 2,969 | 2,231 |
| Ash | 109,978 | 12,098 | 31,615 | 38,964 | 27,301 |
| Balsam poplar | 25,884 | 8,986 | 4,484 | 10,606 | 1,808 |
| Cottonwood | 9,610 | 77 | 27 | 1,025 | 8,481 |
| Bigtooth aspen | 143,373 | 4,336 | 17,011 | 111,076 | 10,950 |
| Quaking aspen | 250,279 | 58,263 | 93,060 | 90,673 | 8,283 |
| Basswood | 95,669 | 8,150 | 29,144 | 50,875 | 7,500 |
| Yellow-poplar | 737 | -- | -- | -- | 737 |
| Black walnut | 2,089 | -- | -- | -- | 2,089 |
| Black cherry | 45,841 | 8,833 | 4,548 | 12,076 | 20,384 |
| Butternut | 156 | -- | -- | 43 | 113 |
| Elm | -13,924 | -12,244 | 1,630 | -1,315 | -1,995 |
| Paper birch | 65,409 | 17,076 | 28,787 | 19,022 | 524 |
| Other hardwoods | 9,990 | 13 | 16 | 2,273 | 7,688 |
| Total | 1,697,518 | 256,755 | 464,345 | 678,777 | 297,641 |
| All species | 2,384,372 | 447,366 | 701,404 | 903,347 | 332,255 |

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[1] International 1/4-inch rule.

Table 46.--Net annual growth of growing stock on commercial forest land by species group and ownership class, Michigan, 1979

(In thousand cubic feet)

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 19,345 | 2,077 | -- | 28 | -- | 5,165 | 156 | 1,829 | 2,063 | 2,516 | 5,511 |
| Red pine | 44,857 | 18,607 | -- | 52 | -- | 11,423 | 823 | 593 | 4,638 | 2,515 | 6,206 |
| Jack pine | 26,700 | 8,287 | -- | 179 | -- | 10,776 | 451 | 575 | 797 | 688 | 4,947 |
| White spruce | 23,053 | 4,308 | -- | 103 | 99 | 3,770 | 214 | 5,095 | 1,934 | 2,772 | 4,758 |
| Black spruce | 12,587 | 2,709 | -- | 1 | 6 | 3,790 | 115 | 2,183 | 704 | 828 | 2,251 |
| Balsam fir | 24,608 | 4,709 | -- | 59 | 5 | 2,932 | 187 | 5,763 | 2,750 | 2,454 | 5,749 |
| Hemlock | 10,814 | 1,346 | -- | 5 | 47 | 1,205 | 107 | 3,619 | 1,047 | 1,063 | 2,375 |
| Tamarack | 161 | -97 | -- | -- | 2 | 937 | 76 | 251 | -307 | -387 | -314 |
| Northern white-cedar | 39,369 | 2,516 | -- | 6 | 8 | 11,191 | 164 | 6,717 | 6,972 | 2,799 | 8,996 |
| Other softwoods | 3,977 | 12 | -- | -- | -- | 107 | -- | -- | 1,112 | 323 | 2,423 |
| Total | 205,471 | 44,474 | -- | 433 | 167 | 51,296 | 2,293 | 26,625 | 21,710 | 15,571 | 42,902 |
| HARDWOODS | | | | | | | | | | | |
| Select white oak | 12,566 | 1,298 | -- | 107 | -- | 1,730 | 77 | 29 | 3,537 | 649 | 5,139 |
| Select red oaks | 33,886 | 897 | -- | 7 | 5 | 8,042 | 437 | 976 | 6,341 | 3,480 | 13,701 |
| Other red oaks | 8,388 | 3,008 | -- | 22 | -- | 849 | 78 | 33 | 1,463 | 301 | 2,634 |
| Hickory | 2,871 | -- | -- | -- | -- | 215 | 26 | -- | 1,680 | 35 | 915 |
| Yellow birch | 9,329 | 1,091 | -- | 31 | 43 | 1,035 | 43 | 2,376 | 663 | 1,957 | 2,090 |
| Hard maple | 94,457 | 10,110 | -- | 10 | 227 | 12,815 | 1,458 | 21,066 | 16,017 | 9,986 | 22,768 |
| Soft maple | 113,426 | 10,838 | -- | 40 | 213 | 21,603 | 1,158 | 13,395 | 21,127 | 11,382 | 33,670 |
| Beech | 6,163 | 1,133 | -- | -- | -- | 563 | 12 | 1,770 | 766 | 444 | 1,475 |
| Ash | 39,045 | 2,045 | -- | 7 | 108 | 5,049 | 519 | 3,917 | 12,589 | 2,717 | 12,094 |
| Balsam poplar | 4,481 | -150 | -- | -- | 1 | 1,185 | 3 | 526 | 1,220 | 234 | 1,462 |
| Cottonwood | 2,500 | -- | -- | -- | -- | 69 | -- | 4 | 1,444 | 195 | 788 |
| Bigtooth aspen | 36,330 | 3,583 | -- | -- | 49 | 9,305 | 394 | 399 | 5,630 | 3,064 | 13,906 |
| Quaking aspen | 52,163 | 5,967 | -- | 123 | 87 | 10,043 | 660 | 4,054 | 10,175 | 5,054 | 16,000 |
| Basswood | 22,318 | 1,970 | -- | -- | 10 | 3,994 | 197 | 2,058 | 6,207 | 1,987 | 5,895 |
| Yellow-poplar | 400 | -- | -- | -- | -- | 0 | -- | -- | 174 | 3 | 223 |
| Black walnut | 796 | -- | -- | -- | -- | 0 | -- | -- | 300 | 11 | 485 |
| Black cherry | 16,830 | 1,695 | -- | -- | 5 | 2,557 | 388 | 1,152 | 5,058 | 1,208 | 4,767 |
| Butternut | 99 | -- | -- | -- | -- | 0 | 8 | -- | 53 | 7 | 31 |
| Elm | -12,374 | -177 | -- | -- | -136 | -2,556 | -70 | -1,004 | -4,487 | -510 | -3,434 |
| Paper birch | 25,532 | 1,718 | -- | 43 | 15 | 5,900 | 86 | 3,135 | 3,887 | 2,955 | 7,793 |
| Other hardwoods | 3,080 | -- | -- | -- | -- | 74 | 63 | 8 | 1,129 | 135 | 1,671 |
| Total | 472,286 | 45,026 | -- | 390 | 627 | 82,472 | 5,537 | 53,894 | 94,973 | 45,294 | 144,073 |
| All species | 677,757 | 89,500 | -- | 823 | 794 | 133,768 | 7,830 | 80,519 | 116,683 | 60,865 | 186,975 |

Table 47.--Net annual growth of sawtimber on commercial forest land by species group and ownership class, Michigan, 1979

(In thousand board feet)[1]

| Species group | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| SOFTWOODS | | | | | | | | | | | |
| White pine | 108,617 | 11,804 | -- | -- | -- | 29,836 | 1,165 | 9,132 | 10,381 | 13,287 | 33,012 |
| Red pine | 117,205 | 47,160 | -- | 935 | -- | 36,835 | 2,875 | 1,171 | 6,719 | 6,838 | 14,672 |
| Jack pine | 104,334 | 29,044 | -- | 1,554 | -- | 49,493 | 582 | 1,691 | 3,688 | 3,778 | 14,504 |
| White spruce | 95,051 | 26,481 | -- | 647 | 52 | 18,249 | 822 | 14,041 | 7,884 | 13,621 | 13,254 |
| Black spruce | 10,896 | 1,057 | -- | -- | -- | 5,387 | 470 | 4,370 | 371 | -386 | -373 |
| Balsam fir | 66,895 | 9,365 | -- | 624 | 429 | 9,768 | 1,668 | 12,742 | 8,726 | 6,466 | 17,107 |
| Hemlock | 63,350 | 7,145 | -- | 28 | 240 | 6,785 | 486 | 26,795 | 4,244 | 6,500 | 11,127 |
| Tamarack | 5,070 | 1,523 | -- | -- | -- | 3,131 | 34 | 1,212 | 471 | -2,042 | 741 |
| Northern white-cedar | 105,695 | 9,326 | -- | 9 | 20 | 25,928 | 407 | 19,976 | 13,476 | 8,701 | 27,852 |
| Other softwoods | 9,741 | 19 | -- | -- | -- | -- | -- | -- | 3,346 | 945 | 5,431 |
| Total | 686,854 | 142,924 | -- | 3,797 | 741 | 185,412 | 8,509 | 91,130 | 59,306 | 57,708 | 137,327 |
| HARDWOODS | | | | | | | | | | | |
| Select white oaks | 68,022 | 5,664 | -- | 591 | -- | 10,134 | 135 | 79 | 25,197 | 5,230 | 20,992 |
| Select red oaks | 186,674 | 3,704 | -- | -- | 30 | 42,038 | 2,675 | 7,321 | 42,921 | 17,237 | 70,748 |
| Other red oaks | 36,495 | 10,883 | -- | -- | -- | 2,634 | 23 | 133 | 6,014 | 2,393 | 14,415 |
| Hickory | 15,022 | -- | -- | -- | -- | 1,582 | 26 | -- | 8,671 | 57 | 4,686 |
| Yellow birch | 32,273 | 1,112 | -- | 88 | 579 | 1,885 | -104 | 12,463 | 6,075 | 5,095 | 5,080 |
| Hard maple | 288,837 | 25,511 | -- | 36 | 775 | 30,795 | 2,332 | 72,061 | 53,872 | 26,723 | 76,732 |
| Soft maple | 301,091 | 26,668 | -- | 219 | 215 | 50,111 | 1,660 | 41,894 | 55,854 | 23,892 | 100,578 |
| Beech | 24,013 | 3,026 | -- | -- | -- | 823 | 39 | 7,766 | 3,214 | 3,742 | 5,403 |
| Ash | 109,978 | 8,405 | -- | -- | 48 | 12,287 | 3,395 | 10,266 | 26,057 | 9,021 | 40,499 |
| Balsam poplar | 25,884 | 438 | -- | -- | 5 | 6,559 | -- | 3,408 | 3,065 | 3,355 | 9,054 |
| Cottonwood | 9,610 | -- | -- | -- | -- | 320 | -- | 21 | 6,430 | 522 | 2,317 |
| Bigtooth aspen | 143,373 | 12,728 | -- | -- | 66 | 32,947 | 4,024 | 2,809 | 23,792 | 10,857 | 56,150 |
| Quaking aspen | 250,279 | 44,321 | -- | -- | 127 | 47,102 | 5,642 | 19,094 | 42,693 | 19,067 | 72,233 |
| Basswood | 95,669 | 8,475 | -- | -- | 69 | 20,943 | 796 | 9,466 | 19,484 | 9,666 | 26,770 |
| Yellow-poplar | 737 | -- | -- | -- | -- | -- | -- | -- | 549 | -5 | 193 |
| Black walnut | 2,089 | -- | -- | -- | -- | -- | -- | -- | 380 | -- | 1,709 |
| Black cherry | 45,841 | 5,869 | -- | -- | -- | 6,039 | 31 | 4,590 | 16,258 | 1,141 | 11,913 |
| Butternut | 156 | -- | -- | -- | -- | -- | 36 | -- | 52 | 68 | -- |
| Elm | -13,924 | 1,015 | -- | -- | -570 | -3,765 | -250 | 1,912 | -5,746 | -938 | -5,582 |
| Paper birch | 65,409 | 8,341 | -- | 32 | -- | 14,858 | 49 | 7,933 | 11,723 | 6,091 | 16,382 |
| Other hardwoods | 9,990 | -- | -- | -- | -- | 856 | 1,476 | 36 | 3,242 | 330 | 4,050 |
| Total | 1,697,518 | 166,160 | -- | 966 | 1,344 | 278,148 | 21,985 | 201,252 | 349,797 | 143,544 | 534,322 |
| All species | 2,384,372 | 309,084 | -- | 4,763 | 2,085 | 463,560 | 30,494 | 292,382 | 409,103 | 201,252 | 671,649 |

[1] International 1/4-inch rule.

## Table 48.--Net annual growth of growing stock on commercial forest land by species group and forest type, Michigan, 1979

(In thousand cubic feet)

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 19,345 | 449 | 1,257 | 5,735 | 898 | 204 | 533 | 807 |
| Red pine | 44,857 | 3,130 | 34,218 | 751 | 95 | 46 | 298 | 27 |
| Jack pine | 26,700 | 19,932 | 2,168 | 133 | 24 | 99 | 697 | -- |
| White spruce | 23,053 | 31 | 396 | 723 | 5,366 | 3,878 | 218 | 932 |
| Black spruce | 12,587 | 310 | 43 | 70 | 1,102 | 41 | 8,974 | 551 |
| Balsam fir | 24,608 | 42 | 70 | 104 | 9,123 | 187 | 802 | -4,549 |
| Hemlock | 10,814 | -- | 134 | 44 | 209 | 3 | 58 | 278 |
| Tamarack | 161 | 3 | 7 | 11 | 90 | 5 | 429 | -2,132 |
| Northern white-cedar | 39,369 | 5 | 24 | 212 | 1,421 | 276 | 850 | 24,934 |
| Other softwoods | 3,977 | -- | 144 | 491 | 5 | 68 | 76 | 179 |
| Total | 205,471 | 23,902 | 38,461 | 8,274 | 18,333 | 4,807 | 12,935 | 21,027 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 12,566 | 53 | 209 | 58 | -- | -- | -- | -- |
| Select red oaks | 33,886 | 1,122 | 284 | 278 | 23 | -- | -- | -- |
| Other red oaks | 8,388 | 421 | 199 | -- | -- | -- | -- | -- |
| Hickory | 2,871 | 7 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 9,329 | -- | -- | 10 | 163 | 6 | 15 | 403 |
| Hard maple | 94,457 | 4 | 86 | 148 | 173 | 41 | 26 | 238 |
| Soft maple | 113,426 | 289 | 473 | 883 | 1,749 | 186 | 460 | 1,521 |
| Beech | 6,163 | -- | 3 | 8 | 6 | 1 | -- | -- |
| Ash | 39,045 | -- | -20 | -- | 320 | -- | 69 | 1,443 |
| Balsam poplar | 4,481 | -- | 2 | 14 | 195 | 10 | 40 | 91 |
| Cottonwood | 2,500 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 36,330 | 119 | 648 | 196 | -16 | 2 | 60 | -70 |
| Quaking aspen | 52,163 | 482 | 721 | 370 | 1,171 | 408 | 888 | 601 |
| Basswood | 22,318 | 11 | 20 | 14 | 11 | -- | -- | 51 |
| Yellow-poplar | 400 | -- | 23 | -- | -- | -- | -- | -- |
| Black walnut | 796 | -- | 3 | -- | -- | -- | -- | -- |
| Black cherry | 16,830 | 20 | 117 | 404 | 130 | 61 | 20 | 20 |
| Butternut | 99 | -- | -- | -- | -- | -- | -- | 5 |
| Elm | -12,374 | -18 | -- | -9 | -229 | -19 | -- | -450 |
| Paper birch | 25,532 | 143 | 88 | 243 | 1,276 | 70 | 467 | 1,169 |
| Other hardwoods | 3,080 | 7 | -- | -- | -- | -- | -- | -7 |
| Total | 472,286 | 2,660 | 2,856 | 2,617 | 4,972 | 766 | 2,045 | 5,015 |
| All species | 677,757 | 26,562 | 41,317 | 10,891 | 23,305 | 5,573 | 14,980 | 26,042 |

(Table 48 continued on next page)

Table 48 continued)

| pecies group | Forest type<br>Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|
| OFTWOODS | | | | | | | | |
| White pine | 43 | 1,220 | 503 | 4,792 | 2,543 | 267 | 86 | 8 |
| Red pine | 7 | 1,957 | 91 | 1,330 | 2,382 | 124 | 374 | 27 |
| Jack pine | 110 | 1,933 | -- | 457 | 940 | 90 | 20 | 97 |
| White spruce | 53 | 125 | 663 | 4,745 | 4,994 | 936 | -- | -7 |
| Black spruce | 285 | 3 | 235 | 17 | 721 | 231 | -- | 4 |
| Balsam fir | 72 | 89 | 1,347 | 7,481 | 8,349 | 1,413 | -- | 78 |
| Hemlock | -- | 22 | 604 | 9,064 | 309 | 89 | -- | -- |
| Tamarack | 1,565 | -- | 93 | -24 | 104 | 4 | -- | 6 |
| Northern white-cedar | 352 | 8 | 2,611 | 3,334 | 4,536 | 797 | 4 | 5 |
| Other softwoods | -- | 67 | 27 | 364 | 9 | -- | 2,547 | -- |
| Total | 2,487 | 5,424 | 6,174 | 31,560 | 24,887 | 3,951 | 3,031 | 218 |
| ARDWOODS | | | | | | | | |
| Select white oaks | -- | 9,562 | 747 | 1,463 | 458 | 16 | -- | -- |
| Select red oaks | -- | 21,380 | 369 | 5,819 | 4,341 | 194 | 73 | 3 |
| Other red oaks | -- | 7,069 | 100 | 409 | 180 | -- | 10 | -- |
| Hickory | -- | 1,698 | 89 | 1,056 | 17 | 4 | -- | -- |
| Yellow birch | -- | 27 | 809 | 7,324 | 273 | 298 | 1 | -- |
| Hard maple | -- | 577 | 872 | 87,337 | 4,227 | 717 | 11 | -- |
| Soft maple | 3 | 7,489 | 20,074 | 58,646 | 18,369 | 3,258 | 14 | 12 |
| Beech | -- | 228 | 30 | 5,758 | 120 | 9 | -- | -- |
| Ash | 11 | 1,299 | 12,541 | 18,777 | 4,074 | 498 | 3 | 30 |
| Balsam poplar | 13 | 13 | 171 | 303 | 3,479 | 143 | 9 | -2 |
| Cottonwood | -- | 331 | 1,163 | 646 | 360 | -- | -- | -- |
| Bigtooth aspen | -- | 4,912 | 232 | 4,319 | 25,701 | 226 | -- | 1 |
| Quaking aspen | 32 | 1,541 | 1,486 | 7,236 | 36,249 | 863 | 38 | 77 |
| Basswood | -- | 568 | 871 | 19,843 | 749 | 139 | 14 | 27 |
| Yellow-poplar | -- | 28 | 11 | 338 | -- | -- | -- | -- |
| Black walnut | -- | 326 | 307 | 160 | -- | -- | -- | -- |
| Black cherry | -- | 2,069 | 1,078 | 11,016 | 1,819 | 34 | 18 | 24 |
| Butternut | -- | 23 | 14 | 57 | -- | -- | -- | -- |
| Elm | -- | -36 | -2,905 | -8,051 | -805 | 148 | -12 | 12 |
| Paper birch | 40 | 434 | 1,160 | 4,223 | 9,010 | 7,199 | -- | 10 |
| Other hardwoods | -- | 155 | 1,424 | 1,398 | 99 | 4 | -- | -- |
| Total | 99 | 59,693 | 40,643 | 228,077 | 108,720 | 13,750 | 179 | 194 |
| All species | 2,586 | 65,117 | 46,817 | 259,637 | 133,607 | 17,701 | 3,210 | 412 |

## Table 49.--Net annual growth of sawtimber on commercial forest land by species group and forest type, Michigan, 1979

(In thousand board feet)[1]

| Species group | All types | Forest type<br>Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 108,617 | 1,888 | 6,531 | 31,975 | 6,478 | 918 | 2,692 | 4,936 |
| Red pine | 117,205 | 13,399 | 76,452 | 2,998 | 527 | 113 | 831 | 118 |
| Jack pine | 104,334 | 80,319 | 7,806 | 1,331 | 29 | 104 | 1,846 | -- |
| White spruce | 95,051 | 121 | 196 | 2,504 | 31,365 | 6,842 | 543 | 2,631 |
| Black spruce | 10,896 | 11 | 86 | 492 | 3,964 | 532 | 5,523 | 13 |
| Balsam fir | 66,895 | 185 | 617 | 248 | 21,380 | 1,909 | 186 | -11,515 |
| Hemlock | 63,350 | -- | 49 | 959 | 1,369 | 21 | 272 | 1,797 |
| Tamarack | 5,070 | -- | 43 | 49 | 1,244 | -18 | 1,667 | -1,987 |
| Northern white-cedar | 105,695 | -- | 18 | 96 | 7,161 | 383 | 3,787 | 60,813 |
| Other softwoods | 9,741 | -- | 1,040 | 1,092 | -- | 1,450 | -- | -- |
| Total | 686,854 | 95,923 | 92,838 | 41,744 | 73,517 | 12,254 | 17,347 | 56,806 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 68,022 | 153 | 252 | 303 | -- | -- | -- | -- |
| Select red oaks | 186,674 | 5,063 | 1,795 | 1,900 | -- | -- | -- | -- |
| Other red oaks | 36,495 | 619 | 540 | -- | -- | -- | -- | -- |
| Hickory | 15,022 | 1,365 | -- | -- | -- | -- | -- | -- |
| Yellow birch | 32,273 | -- | -- | 23 | 1,562 | -1 | 34 | 1,876 |
| Hard maple | 288,837 | -- | 267 | 120 | 245 | 33 | 30 | 573 |
| Soft maple | 301,091 | 80 | 528 | 360 | 8,022 | -- | 120 | 4,015 |
| Beech | 24,013 | -- | 24 | -- | -- | 10 | -- | -- |
| Ash | 109,978 | -- | -127 | -- | 164 | -- | 1,101 | 2,257 |
| Balsam poplar | 25,884 | -- | 9 | 17 | 694 | -41 | 23 | 494 |
| Cottonwood | 9,610 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 143,373 | 969 | 1,875 | 92 | -155 | 13 | 595 | -174 |
| Quaking aspen | 250,279 | 1,052 | 85 | 241 | 10,116 | 851 | 2,007 | 317 |
| Basswood | 95,669 | 21 | 60 | -- | 38 | -- | -- | 205 |
| Yellow-poplar | 737 | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 2,089 | -- | -- | -- | 0 | -- | -- | -- |
| Black cherry | 45,841 | -- | 189 | 779 | 18 | 48 | -- | 4 |
| Butternut | 156 | -- | -- | -- | -- | -- | -- | 9 |
| Elm | -13,924 | -- | -- | -- | 38 | -137 | -- | -1,302 |
| Paper birch | 65,409 | 13 | 84 | 844 | 1,536 | 19 | 2,774 | 4,028 |
| Other hardwoods | 9,990 | -- | -- | -- | -- | -- | -- | -28 |
| Total | 1,697,518 | 9,335 | 5,581 | 4,679 | 22,278 | 795 | 6,684 | 12,274 |
| All species | 2,384,372 | 105,258 | 98,419 | 46,423 | 95,795 | 13,049 | 24,031 | 69,080 |

(Table 49 continued on next page)

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[1] International 1/4-inch

(Table 49 continued)

| Species group | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|
| | Forest type | | | | | | | |
| SOFTWOODS | | | | | | | | |
| White pine | 558 | 10,574 | 3,483 | 23,034 | 13,983 | 1,210 | 334 | 23 |
| Red pine | 36 | 7,094 | 223 | 2,940 | 11,819 | 471 | 107 | 77 |
| Jack pine | 82 | 5,572 | -- | 853 | 5,447 | 812 | 77 | 56 |
| White spruce | -- | 70 | 2,456 | 22,077 | 22,266 | 3,983 | -- | -3 |
| Black spruce | 142 | -- | 477 | -876 | 560 | -46 | -- | 18 |
| Balsam fir | 33 | 42 | 2,765 | 23,974 | 24,274 | 2,776 | -- | 21 |
| Hemlock | -- | 110 | 2,776 | 54,468 | 1,215 | 314 | -- | -- |
| Tamarack | 2,513 | -- | 193 | -17 | 1,303 | 29 | -- | 51 |
| Northern white-cedar | 1,146 | 28 | 6,027 | 11,662 | 11,157 | 3,406 | -- | 11 |
| Other softwoods | -- | 370 | -- | 2,908 | 6 | -- | 2,875 | -- |
| Total | 4,510 | 23,860 | 18,400 | 141,023 | 92,030 | 12,955 | 3,393 | 254 |
| HARDWOODS | | | | | | | | |
| Select white oaks | -- | 46,739 | 2,152 | 12,836 | 5,529 | 58 | -- | -- |
| Select red oaks | -- | 112,314 | 1,351 | 41,782 | 20,613 | 1,797 | 37 | 22 |
| Other red oaks | -- | 29,931 | 840 | 1,947 | 2,618 | -- | -- | -- |
| Hickory | -- | 10,244 | 362 | 2,958 | 62 | 31 | -- | -- |
| Yellow birch | -- | 24 | 3,320 | 25,269 | 118 | 40 | 8 | -- |
| Hard maple | -- | 2,466 | 859 | 278,001 | 4,791 | 1,419 | 33 | -- |
| Soft maple | -- | 15,263 | 80,410 | 170,495 | 18,987 | 2,713 | 42 | 56 |
| Beech | -- | 1,135 | 35 | 22,768 | 40 | 1 | -- | -- |
| Ash | -- | 5,125 | 35,421 | 59,607 | 6,315 | 95 | 20 | -- |
| Balsam poplar | 8 | 27 | 1,585 | 1,496 | 19,670 | 1,917 | -- | -15 |
| Cottonwood | -- | 578 | 4,959 | 2,472 | 1,601 | -- | -- | -- |
| Bigtooth aspen | -- | 14,195 | 2,189 | 19,609 | 103,945 | 220 | -- | -- |
| Quaking aspen | 11 | 1,246 | 7,436 | 58,408 | 164,791 | 3,697 | -- | 21 |
| Basswood | -- | 466 | 4,847 | 84,494 | 3,922 | 1,390 | -- | 226 |
| Yellow-poplar | -- | 109 | 15 | 613 | -- | -- | -- | -- |
| Black walnut | -- | 1,888 | 58 | 143 | -- | -- | -- | -- |
| Black cherry | -- | 6,205 | 5,217 | 31,062 | 2,277 | -- | 42 | -- |
| Butternut | -- | 17 | 36 | 94 | -- | -- | -- | -- |
| Elm | -- | 301 | -3,272 | -8,816 | -766 | -22 | -- | 52 |
| Paper birch | 6 | 1,364 | 5,431 | 12,730 | 15,804 | 20,776 | -- | -- |
| Other hardwoods | -- | 297 | 7,054 | 930 | 854 | 883 | -- | -- |
| Total | 25 | 249,934 | 160,305 | 818,898 | 371,171 | 35,015 | 182 | 362 |
| All species | 4,535 | 273,794 | 178,705 | 959,921 | 463,201 | 47,970 | 3,575 | 616 |

Table 50.--Net annual growth of growing stock on commercial forest land by forest type and stand-age class, Michigan, 1979

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 26,562 | 983 | 2,256 | 2,592 | 4,547 | 8,163 | 4,160 | 1,699 | 1,541 | 475 | 66 | 53 | 27 | -- |
| Red pine | 41,317 | 679 | 4,554 | 17,375 | 9,804 | 4,478 | 531 | 1,296 | 612 | 704 | 378 | 855 | 51 | -- |
| White pine | 10,891 | 71 | 303 | 808 | 129 | 1,588 | 873 | 1,567 | 1,426 | 1,398 | 1,122 | 590 | 626 | 390 |
| Balsam fir | 23,305 | 1,276 | 1,872 | 931 | 3,715 | 4,557 | 4,464 | 2,053 | 1,860 | 970 | 336 | 1,066 | 26 | 179 |
| White spruce | 5,573 | 282 | 774 | 32 | 2,031 | 729 | 675 | 106 | 233 | 289 | 0 | 479 | -- | -57 |
| Black spruce | 14,980 | 1,337 | 1,314 | 1,970 | 3,384 | 1,743 | 2,615 | 1,142 | 946 | 168 | 111 | 107 | 98 | 45 |
| Northern white-cedar | 26,042 | 453 | 1,221 | 1,615 | 2,238 | 1,823 | 2,987 | 4,239 | 3,365 | 2,945 | 1,548 | 2,140 | 926 | 542 |
| Tamarack | 2,586 | 207 | 185 | 312 | 51 | 319 | 665 | 452 | 127 | 29 | 134 | 80 | -- | 25 |
| Oak-hickory | 65,117 | 3,049 | 2,234 | 632 | 4,202 | 9,055 | 13,149 | 7,000 | 7,561 | 6,020 | 3,810 | 6,871 | 1,403 | 131 |
| Elm-ash-soft maple | 46,817 | 2,649 | 3,116 | 3,167 | 5,041 | 6,215 | 5,926 | 5,162 | 3,543 | 3,950 | 1,902 | 4,008 | 1,373 | 765 |
| Maple-birch | 259,637 | 11,356 | 10,768 | 7,383 | 20,500 | 48,828 | 46,807 | 24,323 | 17,749 | 19,632 | 17,072 | 23,847 | 9,202 | 2,170 |
| Aspen | 133,607 | 14,737 | 15,115 | 5,554 | 18,922 | 26,872 | 24,612 | 11,974 | 7,745 | 3,686 | 2,479 | 1,643 | 268 | -- |
| Paper birch | 17,701 | 689 | 492 | 503 | 1,373 | 2,718 | 6,080 | 3,367 | 1,071 | 388 | 644 | 103 | 234 | 39 |
| Exotic | 3,210 | 145 | 617 | 1,672 | 408 | 61 | 307 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 412 | 150 | 83 | 22 | 23 | 36 | 86 | -- | -- | 12 | -- | -- | -- | -- |
| All types | 677,757 | 38,063 | 44,904 | 44,568 | 76,368 | 117,185 | 113,937 | 64,380 | 47,779 | 40,666 | 29,602 | 41,842 | 14,234 | 4,229 |

Table 51.--Net annual growth of sawtimber on commercial forest land by forest type and stand-age class, Michigan, 1979

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 105,258 | 2,533 | 3,046 | 4,584 | 23,656 | 27,595 | 20,694 | 11,645 | 8,884 | 1,321 | 1,083 | 159 | 58 | -- |
| Red pine | 98,419 | 174 | 4,916 | 14,536 | 37,499 | 19,159 | 3,198 | 5,214 | 3,465 | 3,789 | 2,402 | 3,968 | 99 | -- |
| White pine | 46,423 | 161 | 1,804 | 1,274 | 449 | 4,538 | 3,216 | 6,638 | 7,737 | 6,197 | 6,453 | 3,311 | 3,179 | 1,466 |
| Balsam fir | 95,795 | 2,777 | 5,952 | 3,270 | 10,548 | 22,302 | 14,097 | 9,287 | 15,353 | 5,812 | 1,833 | 3,076 | 1,178 | 310 |
| White spruce | 13,049 | 292 | 1,330 | -- | 2,369 | 1,830 | 771 | 2,617 | 567 | 1,958 | -- | 1,591 | -- | -276 |
| Black spruce | 24,031 | 1,904 | 3,440 | 4,018 | 2,678 | 2,367 | 2,298 | 3,908 | 329 | -- | 866 | 1,061 | 1,329 | -167 |
| Northern white-cedar | 69,080 | 1,927 | 817 | 2,090 | 2,201 | 3,571 | 7,276 | 9,375 | 4,902 | 7,615 | 3,974 | 11,913 | 6,343 | 7,076 |
| Tamarack | 4,535 | 1,013 | 292 | 1,174 | 60 | 67 | 294 | 291 | 192 | 35 | 491 | 493 | -- | 133 |
| Oak-hickory | 273,794 | 9,783 | 7,670 | 1,483 | 12,366 | 26,009 | 41,917 | 30,107 | 42,232 | 36,883 | 14,164 | 42,435 | 8,031 | 714 |
| Elm-ash-soft maple | 178,705 | 12,179 | 6,464 | 6,078 | 14,275 | 16,329 | 28,668 | 17,888 | 16,138 | 22,249 | 6,995 | 23,456 | 4,646 | 3,340 |
| Maple-birch | 959,921 | 26,700 | 25,741 | 16,018 | 48,138 | 142,912 | 136,572 | 92,243 | 81,796 | 116,461 | 87,253 | 123,197 | 48,431 | 14,459 |
| Aspen | 463,201 | 30,464 | 19,764 | 11,285 | 46,804 | 91,423 | 98,728 | 69,701 | 42,476 | 22,899 | 17,346 | 11,187 | 1,124 | -- |
| Paper birch | 47,970 | 2,830 | 522 | 23 | 1,898 | 5,772 | 18,752 | 8,069 | 3,078 | 1,165 | 4,601 | 911 | 278 | 71 |
| Exotic | 3,575 | -- | 89 | 164 | 1,603 | 660 | 1,059 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 616 | 8 | 304 | -- | -- | 172 | 82 | -- | -- | 50 | -- | -- | -- | -- |
| All types | 2,384,372 | 92,745 | 82,151 | 65,997 | 204,544 | 364,706 | 377,622 | 266,983 | 227,149 | 226,434 | 147,461 | 226,758 | 74,696 | 27,126 |

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[1] International 1/4-inch rule.

Table 52.--Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Michigan, 1979

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | | |
| Sawtimber | 5,762 | -- | -- | 99 | 153 | 447 | 738 | 1,303 | 1,088 | 648 | 505 | 781 | -- | -- | -- |
| Poletimber | 16,587 | -- | 62 | 259 | 455 | 943 | 1,316 | 1,552 | 2,154 | 1,369 | 2,650 | 2,914 | 2,868 | -- | 45 |
| Sapling & seedling | 4,213 | 29 | 94 | 123 | 628 | 482 | 672 | 589 | 849 | 128 | 130 | -- | 489 | -- | -- |
| All stands | 26,562 | 29 | 156 | 481 | 1,236 | 1,872 | 2,726 | 3,444 | 4,091 | 2,145 | 3,285 | 3,695 | 3,357 | -- | 45 |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 7,350 | -- | 13 | -- | 288 | 247 | 46 | 429 | 728 | 539 | 455 | 989 | 2,008 | 1,116 | 492 |
| Poletimber | 29,843 | -- | -- | -- | 88 | 390 | 766 | 1,252 | 2,558 | 2,124 | 1,548 | 4,615 | 5,731 | 6,441 | 4,330 |
| Sapling & seedling | 4,124 | 25 | 237 | 140 | 176 | 173 | 1,184 | 236 | 1,310 | 283 | -- | 300 | 60 | -- | -- |
| All stands | 41,317 | 25 | 250 | 140 | 552 | 810 | 1,996 | 1,917 | 4,596 | 2,946 | 2,003 | 5,904 | 7,799 | 7,557 | 4,822 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 7,724 | -- | -- | 19 | 220 | 185 | 151 | 393 | 985 | 635 | 837 | 1,695 | 498 | 2,106 | -- |
| Poletimber | 2,728 | -- | -- | -- | -- | 96 | 144 | 312 | 344 | 453 | 68 | 697 | 614 | -- | -- |
| Sapling & seedling | 439 | 11 | 23 | 70 | 33 | 95 | 54 | 153 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 10,891 | 11 | 23 | 89 | 253 | 376 | 349 | 858 | 1,329 | 1,088 | 905 | 2,392 | 1,112 | 2,106 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | 4,801 | -- | -- | -- | -- | -- | 227 | 125 | -- | 562 | 923 | 1,021 | 1,914 | -84 | 113 |
| Poletimber | 14,610 | -- | -- | 29 | 47 | 392 | 188 | 1,215 | 1,172 | 971 | 1,818 | 4,013 | 2,798 | 1,431 | 536 |
| Sapling & seedling | 3,894 | 8 | 88 | 71 | 614 | 612 | 286 | 885 | 440 | 448 | 245 | 146 | 26 | 25 | -- |
| All stands | 23,305 | 8 | 88 | 100 | 661 | 1,004 | 701 | 2,225 | 1,612 | 1,981 | 2,986 | 5,180 | 4,738 | 1,372 | 649 |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | 1,027 | -- | -- | -- | 38 | 62 | -- | 66 | 87 | 68 | 93 | 205 | 221 | 151 | 36 |
| Poletimber | 3,458 | -- | -- | -- | -- | 35 | -- | 419 | 276 | 439 | 184 | 172 | 1,696 | 129 | 108 |
| Sapling & seedling | 1,088 | -- | 42 | 82 | 186 | 36 | 43 | 78 | 131 | -- | -- | 490 | -- | -- | -- |
| All stands | 5,573 | -- | 42 | 82 | 224 | 133 | 43 | 563 | 494 | 507 | 277 | 867 | 1,917 | 280 | 144 |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | 350 | -- | -- | -- | -- | -- | 32 | -- | 64 | 121 | -- | 49 | 84 | -- | -- |
| Poletimber | 9,926 | 6 | -- | 25 | 551 | 234 | 695 | 512 | 278 | 616 | 832 | 4,345 | 1,235 | 286 | 311 |
| Sapling & seedling | 4,704 | 10 | 286 | 43 | 443 | 634 | 480 | 987 | 193 | 183 | 855 | 403 | 187 | -- | -- |
| All stands | 14,980 | 16 | 286 | 68 | 994 | 868 | 1,207 | 1,499 | 535 | 920 | 1,687 | 4,797 | 1,506 | 286 | 311 |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | 3,066 | -- | -- | -- | 49 | 44 | 63 | 184 | 259 | -- | 418 | 1,344 | 952 | 679 | -926 |
| Poletimber | 18,456 | -- | -- | -- | 172 | 20 | 266 | 293 | 451 | 383 | 959 | 2,215 | 5,457 | 3,991 | 4,249 |
| Sapling & seedling | 4,520 | 113 | 11 | 22 | 46 | 180 | 68 | 551 | 510 | 89 | 506 | 748 | 1,150 | 522 | 4 |
| All stands | 26,042 | 113 | 11 | 22 | 267 | 244 | 397 | 1,028 | 1,220 | 472 | 1,883 | 4,307 | 7,559 | 5,192 | 3,327 |

(Table 52 continued on next page)

(Table 52 continued)

| Forest type and | All | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| stand-size class | classes | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | | |
| Sawtimber | 333 | -- | -- | 19 | 3 | 25 | -- | -- | 202 | -- | -- | -- | 84 | -- | -- |
| Poletimber | 1,297 | -- | -- | -- | 179 | 137 | 120 | 171 | 222 | 222 | 127 | 119 | -- | -- | -- |
| Sapling & seedling | 956 | 9 | 40 | 150 | 127 | 73 | 24 | 112 | 194 | 203 | 10 | -- | 14 | -- | -- |
| All stands | 2,586 | 9 | 40 | 169 | 309 | 235 | 144 | 283 | 618 | 425 | 137 | 119 | 98 | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 26,185 | 6 | -- | 83 | 191 | 997 | 1,519 | 2,169 | 3,303 | 3,293 | 2,919 | 5,865 | 4,963 | 877 | -- |
| Poletimber | 33,273 | -- | 10 | -- | 100 | 1,607 | 2,908 | 3,648 | 3,948 | 4,115 | 5,141 | 6,505 | 3,828 | 1,044 | 419 |
| Sapling & seedling | 5,659 | 37 | 430 | 229 | 1,344 | 1,491 | 1,065 | 894 | 45 | 20 | 51 | 53 | -- | -- | -- |
| All stands | 65,117 | 43 | 440 | 312 | 1,635 | 4,095 | 5,492 | 6,711 | 7,296 | 7,428 | 8,111 | 12,423 | 8,791 | 1,921 | 419 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 17,670 | -- | -- | 69 | 305 | 672 | 629 | 1,095 | 2,516 | 1,349 | 855 | 3,390 | 4,503 | 1,771 | 516 |
| Poletimber | 22,204 | -- | 217 | 109 | 690 | 1,803 | 237 | 2,217 | 2,730 | 1,033 | 5,562 | 2,779 | 2,712 | 1,799 | 316 |
| Sapling & seedling | 6,943 | 25 | 175 | 392 | 1,046 | 1,340 | 1,398 | 907 | 717 | 78 | 526 | 279 | 60 | -- | -- |
| All stands | 46,817 | 25 | 392 | 570 | 2,041 | 3,815 | 2,264 | 4,219 | 5,963 | 2,460 | 6,943 | 6,448 | 7,275 | 3,570 | 832 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 95,744 | -- | 42 | -- | 287 | 885 | 1,081 | 4,456 | 8,295 | 6,205 | 13,175 | 23,046 | 26,271 | 9,716 | 2,285 |
| Poletimber | 138,076 | -- | 51 | 197 | 1,540 | 1,624 | 2,134 | 8,565 | 12,301 | 10,652 | 17,980 | 33,007 | 37,011 | 12,504 | 510 |
| Sapling & seedling | 25,817 | 97 | 1,172 | 832 | 3,160 | 3,230 | 3,314 | 5,157 | 2,967 | 3,014 | 940 | 1,305 | 629 | -- | -- |
| All stands | 259,637 | 97 | 1,265 | 1,029 | 4,987 | 5,739 | 6,529 | 18,178 | 23,563 | 19,871 | 32,095 | 57,358 | 63,911 | 22,220 | 2,795 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 22,463 | -- | 124 | 17 | 348 | 817 | 645 | 1,424 | 2,525 | 1,765 | 2,748 | 3,531 | 5,269 | 2,299 | 951 |
| Poletimber | 79,037 | -- | 56 | 131 | 1,807 | 3,495 | 4,346 | 7,481 | 8,403 | 7,528 | 11,903 | 12,521 | 13,790 | 6,256 | 1,320 |
| Sapling & seedling | 32,107 | 196 | 1,520 | 2,826 | 4,022 | 7,168 | 3,569 | 4,549 | 2,032 | 1,084 | 3,075 | 781 | 1,285 | -- | -- |
| All stands | 133,607 | 196 | 1,700 | 2,974 | 6,177 | 11,480 | 8,560 | 13,454 | 12,960 | 10,377 | 17,726 | 16,833 | 20,344 | 8,555 | 2,271 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 1,713 | -- | -- | -- | 35 | -- | 37 | 210 | -- | 52 | 353 | 487 | 529 | -- | 10 |
| Poletimber | 14,499 | -- | -- | -- | 149 | 528 | 535 | 813 | 1,195 | 945 | 1,859 | 2,019 | 5,112 | 1,167 | 177 |
| Sapling & seedling | 1,489 | 4 | 8 | 45 | 225 | 263 | 54 | 165 | 130 | 127 | 325 | 143 | -- | -- | -- |
| All stands | 17,701 | 4 | 8 | 45 | 409 | 791 | 626 | 1,188 | 1,325 | 1,124 | 2,537 | 2,649 | 5,641 | 1,167 | 187 |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | 252 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 252 | -- | -- | -- |
| Poletimber | 2,021 | -- | -- | -- | -- | -- | 158 | -- | 55 | 197 | 401 | 713 | 375 | 122 | -- |
| Sapling & seedling | 937 | -- | 20 | 202 | 114 | 13 | -- | 66 | 344 | -- | 165 | -- | 13 | -- | -- |
| All stands | 3,210 | -- | 20 | 202 | 114 | 13 | 158 | 66 | 399 | 197 | 566 | 965 | 388 | 122 | -- |
| Nonstocked | 412 | 124 | 210 | 2 | 6 | -- | -2 | 24 | 48 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 194,440 | 6 | 179 | 306 | 1,917 | 4,381 | 5,168 | 11,854 | 20,052 | 15,237 | 23,281 | 42,655 | 47,296 | 18,631 | 3,477 |
| Poletimber | 386,015 | 6 | 396 | 750 | 5,778 | 11,304 | 13,813 | 28,450 | 36,087 | 31,047 | 51,032 | 76,634 | 83,227 | 35,170 | 12,321 |
| Sapling & seedling | 96,890 | 564 | 4,146 | 5,227 | 12,164 | 15,790 | 12,211 | 15,329 | 9,862 | 5,657 | 6,828 | 4,648 | 3,913 | 547 | 4 |
| Nonstocked | 412 | 124 | 210 | 2 | 6 | -- | -2 | 24 | 48 | -- | -- | -- | -- | -- | -- |
| All stands | 677,757 | 700 | 4,931 | 6,285 | 19,865 | 31,475 | 31,190 | 55,657 | 66,049 | 51,941 | 81,141 | 123,937 | 134,436 | 54,348 | 15,802 |

Table 53.--Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Michigan, 1979

(In thousand board feet)[1]

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | | |
| Sawtimber | 40,466 | -- | -- | 359 | 444 | 1,762 | 6,751 | 8,176 | 7,088 | 5,174 | 4,725 | 5,987 | -- | -- | -- |
| Poletimber | 58,347 | -- | 921 | 285 | 1,776 | 10,032 | 3,402 | 6,360 | 6,909 | 3,983 | 12,628 | 5,418 | 6,150 | -- | 483 |
| Sapling & seedling | 6,445 | 59 | 233 | 102 | 1,514 | 2,301 | 387 | 982 | 802 | 65 | -- | -- | -- | -- | -- |
| All stands | 105,258 | 59 | 1,154 | 746 | 3,734 | 14,095 | 10,540 | 15,518 | 14,799 | 9,222 | 17,353 | 11,405 | 6,150 | -- | 483 |
| Red pine | | | | | | | | | | | | | | | |
| Sawtimber | 42,370 | -- | 74 | -- | 1,774 | 1,170 | 226 | 1,901 | 4,394 | 2,462 | 2,861 | 6,178 | 13,102 | 5,914 | 2,314 |
| Poletimber | 52,397 | -- | -- | -- | 244 | 456 | 2,995 | 731 | 5,946 | 1,920 | 200 | 8,772 | 7,333 | 14,985 | 8,815 |
| Sapling & seedling | 3,652 | 136 | 19 | 639 | -- | 96 | 2,182 | 248 | -- | 332 | -- | -- | -- | -- | -- |
| All stands | 98,419 | 136 | 93 | 639 | 2,018 | 1,722 | 5,403 | 2,880 | 10,340 | 4,714 | 3,061 | 14,950 | 20,435 | 20,899 | 11,129 |
| White pine | | | | | | | | | | | | | | | |
| Sawtimber | 38,288 | -- | -- | 410 | 525 | 1,023 | 331 | 2,084 | 4,325 | 3,780 | 4,461 | 8,116 | 1,959 | 11,274 | -- |
| Poletimber | 5,925 | -- | -- | -- | -- | 409 | 273 | 113 | 426 | 963 | 124 | 2,838 | 779 | -- | -- |
| Sapling & seedling | 2,210 | 65 | 123 | 339 | 164 | 155 | 315 | 1,049 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 46,423 | 65 | 123 | 749 | 689 | 1,587 | 919 | 3,246 | 4,751 | 4,743 | 4,585 | 10,954 | 2,738 | 11,274 | -- |
| Balsam fir | | | | | | | | | | | | | | | |
| Sawtimber | 31,986 | -- | -- | -- | -- | -- | 1,215 | 172 | -- | 3,274 | 2,838 | 13,983 | 8,562 | 496 | 1,446 |
| Poletimber | 52,031 | -- | -- | 33 | 84 | 591 | 101 | 5,913 | 4,259 | 1,461 | 5,584 | 12,439 | 12,617 | 6,636 | 2,313 |
| Sapling & seedling | 11,778 | 10 | 96 | 1,070 | 2,121 | 3,257 | 1,015 | 2,554 | 255 | 1,005 | 237 | 70 | 88 | -- | -- |
| All stands | 95,795 | 10 | 96 | 1,103 | 2,205 | 3,848 | 2,331 | 8,639 | 4,514 | 5,740 | 8,659 | 26,492 | 21,267 | 7,132 | 3,759 |
| White spruce | | | | | | | | | | | | | | | |
| Sawtimber | 4,699 | -- | -- | -- | 108 | 288 | -- | 288 | 283 | 131 | 88 | 641 | 1,270 | 401 | 1,201 |
| Poletimber | 6,730 | -- | -- | -- | -- | 65 | -- | 73 | 660 | 1,609 | 462 | 1,005 | 1,189 | 1,556 | 111 |
| Sapling & seedling | 1,620 | -- | 66 | 113 | 85 | 169 | 75 | 148 | 964 | -- | -- | -- | -- | -- | -- |
| All stands | 13,049 | -- | 66 | 113 | 193 | 522 | 75 | 509 | 1,907 | 1,740 | 550 | 1,646 | 2,459 | 1,957 | 1,312 |
| Black spruce | | | | | | | | | | | | | | | |
| Sawtimber | 1,892 | -- | -- | -- | -- | -- | 104 | -- | 129 | 147 | -- | 151 | 1,361 | -- | -- |
| Poletimber | 13,948 | -- | -- | 466 | 1,302 | 120 | 303 | 1,045 | 911 | 119 | 2,193 | 2,868 | 3,232 | 1,369 | 20 |
| Sapling & seedling | 8,191 | -5 | 2,493 | -- | 865 | 1,672 | 726 | 414 | 575 | 628 | 749 | 26 | 48 | -- | -- |
| All stands | 24,031 | -5 | 2,493 | 466 | 2,167 | 1,792 | 1,133 | 1,459 | 1,615 | 894 | 2,942 | 3,045 | 4,641 | 1,369 | 20 |
| Northern white-cedar | | | | | | | | | | | | | | | |
| Sawtimber | 27,615 | -- | -- | -- | 181 | 72 | 279 | 710 | 988 | -- | 2,740 | 7,173 | 5,674 | 7,133 | 2,665 |
| Poletimber | 35,800 | -- | -- | -- | 51 | 16 | 46 | 958 | 804 | 67 | 2,722 | 4,754 | 9,118 | 8,325 | 8,939 |
| Sapling & seedling | 5,665 | 837 | 29 | 55 | 27 | 425 | 19 | 1,023 | 586 | 578 | 370 | 1,159 | 240 | 300 | 17 |
| All stands | 69,080 | 837 | 29 | 55 | 259 | 513 | 344 | 2,691 | 2,378 | 645 | 5,832 | 13,086 | 15,032 | 15,758 | 11,621 |

(Table 53 continued on next page)

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[1] International 1/4-inch rule.

(Table 53 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | |
| Sawtimber | 1,267 | -- | -- | 109 | 26 | 133 | -- | -- | 613 | -- | -- | -- | 386 | -- | -- |
| Poletimber | 775 | -- | -- | -- | 35 | 61 | 110 | 157 | 167 | 163 | 79 | 3 | -- | -- | -- |
| Sapling & seedling | 2,493 | -- | 912 | 101 | 759 | -- | 68 | 139 | 5 | 95 | -- | -- | 414 | -- | -- |
| All stands | 4,535 | -- | 912 | 210 | 820 | 194 | 178 | 296 | 785 | 258 | 79 | 3 | 800 | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | |
| Sawtimber | 148,569 | 32 | -- | 1,008 | 1,168 | 4,111 | 9,901 | 9,290 | 16,249 | 25,003 | 14,860 | 26,583 | 35,205 | 5,159 | -- |
| Poletimber | 107,659 | -- | 16 | -- | 25 | 2,726 | 6,941 | 11,816 | 15,109 | 12,218 | 13,753 | 26,883 | 13,186 | 3,785 | 1,201 |
| Sapling & seedling | 17,566 | 127 | 936 | 310 | 3,363 | 5,949 | 2,129 | 4,271 | 148 | 33 | 225 | 75 | -- | -- | -- |
| All stands | 273,794 | 159 | 952 | 1,318 | 4,556 | 12,786 | 18,971 | 25,377 | 31,506 | 37,254 | 28,838 | 53,541 | 48,391 | 8,944 | 1,201 |
| Elm-ash-soft maple | | | | | | | | | | | | | | |
| Sawtimber | 99,061 | -- | -- | 1,934 | 3,331 | 6,050 | 4,807 | 8,299 | 12,244 | 5,751 | 5,649 | 18,434 | 21,474 | 10,298 | 790 |
| Poletimber | 58,776 | -- | 122 | 104 | 3,625 | 2,288 | 1,491 | 6,212 | 6,319 | 1,965 | 15,507 | 7,001 | 7,571 | 5,034 | 1,537 |
| Sapling & seedling | 20,868 | 323 | 234 | 891 | 2,642 | 5,585 | 5,605 | 572 | 2,806 | -262 | 1,958 | 44 | 470 | -- | -- |
| All stands | 178,705 | 323 | 356 | 2,929 | 9,598 | 13,923 | 11,903 | 15,083 | 21,369 | 7,454 | 23,114 | 25,479 | 29,515 | 15,332 | 2,327 |
| Maple-birch | | | | | | | | | | | | | | |
| Sawtimber | 515,311 | -- | 567 | -- | 1,063 | 5,858 | 4,832 | 17,499 | 41,168 | 25,704 | 76,718 | 123,977 | 148,737 | 59,345 | 9,843 |
| Poletimber | 385,353 | -- | 15 | 198 | 1,283 | 5,113 | 6,816 | 20,755 | 25,108 | 26,250 | 44,898 | 90,005 | 116,914 | 45,942 | 2,056 |
| Sapling & seedling | 59,257 | 230 | 1,343 | 4,244 | 8,060 | 7,013 | 6,294 | 11,488 | 5,031 | 7,029 | 3,765 | 4,201 | 559 | -- | -- |
| All stands | 959,921 | 230 | 1,925 | 4,442 | 10,406 | 17,984 | 17,942 | 49,742 | 71,307 | 58,983 | 125,381 | 218,183 | 266,210 | 105,287 | 11,899 |
| Aspen | | | | | | | | | | | | | | |
| Sawtimber | 152,662 | -- | 73 | 82 | 913 | 5,636 | 3,731 | 14,467 | 20,232 | 12,379 | 18,594 | 20,441 | 35,641 | 11,664 | 8,809 |
| Poletimber | 254,157 | -- | 8 | 599 | 4,304 | 4,940 | 6,623 | 25,061 | 21,220 | 27,303 | 35,520 | 44,724 | 53,987 | 18,033 | 11,835 |
| Sapling & seedling | 56,382 | 52 | 4,081 | 4,649 | 10,422 | 13,803 | 6,640 | 7,708 | 5,318 | 1,408 | 965 | 998 | 338 | -- | -- |
| All stands | 463,201 | 52 | 4,162 | 5,330 | 15,639 | 24,379 | 16,994 | 47,236 | 46,770 | 41,090 | 55,079 | 66,163 | 89,966 | 29,697 | 20,644 |
| Paper birch | | | | | | | | | | | | | | |
| Sawtimber | 8,316 | -- | -- | -- | 141 | -- | 81 | 247 | -- | 119 | 717 | 2,453 | 4,514 | -- | 44 |
| Poletimber | 37,712 | -- | -- | -- | 94 | 3,407 | 1,478 | 1,477 | 2,658 | 245 | 1,574 | 3,765 | 15,745 | 7,176 | 93 |
| Sapling & seedling | 1,942 | 29 | -- | 82 | 43 | 285 | 153 | 1,188 | 61 | 93 | -- | 8 | -- | -- | -- |
| All stands | 47,970 | 29 | -- | 82 | 278 | 3,692 | 1,712 | 2,912 | 2,719 | 457 | 2,291 | 6,226 | 20,259 | 7,176 | 137 |
| Exotic | | | | | | | | | | | | | | |
| Sawtimber | 980 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 980 | -- | -- | -- |
| Poletimber | 2,469 | -- | -- | -- | -- | -- | -- | -- | 79 | -- | 57 | 1,572 | 42 | 719 | -- |
| Sapling & seedling | 126 | -- | -- | -- | -- | -- | -- | -- | 80 | -- | 46 | -- | -- | -- | -- |
| All stands | 3,575 | -- | -- | -- | -- | -- | -- | -- | 159 | -- | 103 | 2,552 | 42 | 719 | -- |
| Nonstocked | 616 | 32 | 608 | 38 | 5 | -- | -41 | -- | -26 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | |
| Sawtimber | 1,113,482 | 32 | 714 | 3,902 | 9,674 | 26,103 | 32,258 | 63,133 | 107,713 | 83,924 | 134,251 | 235,097 | 277,885 | 111,684 | 27,112 |
| Poletimber | 1,072,079 | -- | 1,082 | 1,685 | 12,823 | 30,224 | 30,579 | 80,671 | 90,575 | 78,266 | 135,301 | 212,047 | 247,863 | 113,560 | 37,403 |
| Sapling & seedling | 198,195 | 1,863 | 10,565 | 12,595 | 30,065 | 40,710 | 25,608 | 31,784 | 16,631 | 11,004 | 8,315 | 6,581 | 2,157 | 300 | 17 |
| Nonstocked | 616 | 32 | 608 | 38 | 5 | -- | -41 | -- | -26 | -- | -- | -- | -- | -- | -- |
| All stands | 2,384,372 | 1,927 | 12,969 | 18,220 | 52,567 | 97,037 | 88,404 | 175,588 | 214,893 | 173,194 | 277,867 | 453,725 | 527,905 | 225,544 | 64,532 |

Table 54.--Timber removals[1] from growing stock on commercial forest land by species group and Forest Survey Unit, Michigan 1979

(In thousand cubic feet)

| Species group | All Units | Forest Survey Unit: Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| White pine | 5,097 | 1,691 | 2,409 | 872 | 125 |
| Red pine | 7,798 | 1,422 | 1,945 | 3,105 | 1,326 |
| Jack pine | 16,192 | 5,230 | 2,889 | 7,999 | 74 |
| White spruce | 2,194 | 997 | 1,100 | 87 | 10 |
| Black spruce | 2,441 | 1,432 | 921 | 88 | -- |
| Balsam fir | 8,931 | 4,273 | 3,816 | 842 | -- |
| Hemlock | 6,633 | 2,554 | 3,868 | 185 | 26 |
| Tamarack | 772 | 151 | 79 | 438 | 104 |
| Northern white-cedar | 6,088 | 3,396 | 976 | 1,633 | 83 |
| Other softwoods | 221 | -- | -- | -- | 221 |
| Total | 56,367 | 21,146 | 18,003 | 15,249 | 1,969 |
| HARDWOODS | | | | | |
| Select white oaks | 8,984 | 17 | 23 | 3,006 | 5,938 |
| Select red oaks | 20,599 | 151 | 1,417 | 11,720 | 7,311 |
| Other red oaks | 6,073 | -- | -- | 3,541 | 2,532 |
| Hickory | 647 | -- | -- | 15 | 632 |
| Yellow birch | 4,894 | 1,616 | 3,224 | 40 | 14 |
| Hard maple | 32,271 | 9,179 | 14,549 | 5,310 | 3,233 |
| Soft maple | 23,982 | 3,189 | 6,075 | 8,839 | 5,879 |
| Beech | 5,840 | 3,444 | 101 | 1,539 | 756 |
| Ash | 5,614 | 313 | 547 | 2,090 | 2,664 |
| Balsam poplar | 2,370 | 926 | 651 | 784 | 9 |
| Cottonwood | 1,291 | -- | -- | 454 | 837 |
| Bigtooth aspen | 31,390 | 1,509 | 3,792 | 25,206 | 883 |
| Quaking aspen | 51,805 | 8,658 | 22,510 | 20,023 | 614 |
| Basswood | 4,794 | 482 | 1,153 | 1,980 | 1,179 |
| Black walnut | 205 | -- | -- | -- | 205 |
| Elm | 6,997 | 1,289 | 3,351 | 1,731 | 626 |
| Paper birch | 7,734 | 2,471 | 2,574 | 2,579 | 110 |
| Other hardwoods[2] | 2,739 | 108 | 332 | 418 | 1,881 |
| Total | 218,229 | 33,352 | 60,299 | 89,275 | 35,303 |
| All species | 274,596 | 54,498 | 78,302 | 104,524 | 37,272 |

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[1] Removals in 1979 are trend-level removals.

[2] Includes black cherry, butternut, and yellow-poplar.

### Table 55.--Timber removals[1] from sawtimber on commercial forest land by species group and Forest Survey Unit, Michigan, 1979

(In thousand board feet)[2]

| Species group | All Units | Forest Survey Unit: Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| SOFTWOODS | | | | | |
| White pine | 24,939 | 7,518 | 12,010 | 4,749 | 662 |
| Red pine | 27,365 | 5,571 | 7,770 | 10,636 | 3,388 |
| Jack pine | 40,291 | 11,894 | 7,680 | 20,583 | 134 |
| White spruce | 9,166 | 4,617 | 4,233 | 316 | -- |
| Black spruce | 2,830 | 1,761 | 956 | 113 | -- |
| Balsam fir | 23,301 | 10,525 | 9,512 | 3,264 | -- |
| Hemlock | 23,663 | 9,043 | 13,748 | 805 | 67 |
| Tamarack | 766 | 426 | 147 | 185 | 8 |
| Northern white-cedar | 12,847 | 7,071 | 2,130 | 3,627 | 19 |
| Other softwoods | 25 | -- | -- | -- | 25 |
| Total | 165,193 | 58,426 | 58,186 | 44,278 | 4,303 |
| HARDWOODS | | | | | |
| Select white oaks | 39,366 | 8 | 94 | 9,022 | 30,242 |
| Select red oaks | 79,627 | 611 | 4,832 | 38,084 | 36,100 |
| Other red oaks | 24,026 | -- | -- | 11,073 | 12,953 |
| Hickory | 3,229 | -- | -- | 93 | 3,136 |
| Yellow birch | 19,913 | 7,114 | 12,551 | 188 | 60 |
| Hard maple | 148,076 | 42,700 | 62,127 | 25,517 | 17,732 |
| Soft maple | 73,409 | 9,039 | 9,885 | 26,621 | 27,864 |
| Beech | 29,468 | 17,080 | 519 | 7,967 | 3,902 |
| Ash | 23,877 | 1,024 | 1,507 | 8,784 | 12,562 |
| Balsam poplar | 5,483 | 1,645 | 1,108 | 2,701 | 29 |
| Cottonwood | 6,535 | -- | -- | 2,332 | 4,203 |
| Bigtooth aspen | 80,876 | 2,868 | 11,389 | 63,600 | 3,019 |
| Quaking aspen | 143,925 | 18,022 | 60,776 | 63,275 | 1,852 |
| Basswood | 22,633 | 2,404 | 4,466 | 9,760 | 6,003 |
| Black walnut | 1,134 | -- | -- | -- | 1,134 |
| Elm | 23,142 | 4,917 | 10,987 | 5,975 | 1,263 |
| Paper birch | 16,538 | 6,071 | 4,842 | 5,208 | 417 |
| Other hardwoods[3] | 9,063 | 377 | 539 | 806 | 7,341 |
| Total | 750,320 | 113,880 | 185,622 | 281,006 | 169,812 |
| All species | 915,513 | 172,306 | 243,808 | 325,284 | 174,115 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes black cherry, butternut, and yellow-poplar.

Table 56.--Timber removals[1] from growing stock and sawtimber on commercial forest land by species group, Michigan, 1965 and 1979

| Species group | Growing stock | | Sawtimber | |
|---|---|---|---|---|
| | [2] 1965 | 1979 | [2] 1965 | 1979 |
| | Thousand cubic feet | | Thousand board feet[3] | |
| SOFTWOODS | | | | |
| White pine | 2,972 | 5,097 | 15,757 | 24,939 |
| Red pine | 2,497 | 7,798 | 9,569 | 27,365 |
| Jack pine | 17,771 | 16,192 | 46,882 | 40,291 |
| White spruce | 2,847 | 2,194 | 14,292 | 9,166 |
| Black spruce | 3,450 | 2,441 | 8,015 | 2,830 |
| Balsam fir | 7,493 | 8,931 | 23,750 | 23,301 |
| Hemlock | 11,095 | 6,633 | 58,487 | 23,663 |
| Tamarack | 1,380 | 772 | 2,459 | 766 |
| Northern white-cedar | 9,284 | 6,088 | 12,814 | 12,847 |
| Other softwoods | 190 | 221 | 118 | 25 |
| Total | 58,979 | 56,367 | 192,143 | 165,193 |
| HARDWOODS | | | | |
| Select white oaks | 6,293 | 8,984 | 29,566 | 39,366 |
| Select red oaks | 13,306 | 20,599 | 55,367 | 79,627 |
| Other red oaks | 3,679 | 6,073 | 13,956 | 24,026 |
| Hickory | 760 | 647 | 3,771 | 3,229 |
| Yellow birch | 7,569 | 4,894 | 42,335 | 19,913 |
| Hard maple | 27,305 | 32,271 | 142,103 | 148,076 |
| Soft maple | 12,585 | 23,982 | 47,954 | 73,409 |
| Beech | 5,550 | 5,840 | 32,126 | 29,468 |
| Ash | 3,538 | 5,614 | 14,284 | 23,877 |
| Balsam poplar | 1,297 | 2,370 | 7,208 | 5,483 |
| Cottonwood | 1,249 | 1,291 | 7,076 | 6,535 |
| Bigtooth aspen | 26,072 | 31,390 | 86,887 | 80,876 |
| Quaking aspen | 46,868 | 51,805 | 121,708 | 143,925 |
| Basswood | 3,685 | 4,794 | 20,305 | 22,633 |
| Black walnut | 382 | 205 | 2,364 | 1,134 |
| Elm | 11,859 | 6,997 | 65,595 | 23,142 |
| Paper birch | 4,873 | 7,734 | 14,735 | 16,538 |
| Other hardwoods[4] | 3,744 | 2,739 | 16,342 | 9,063 |
| Total | 180,614 | 218,229 | 723,682 | 750,320 |
| All species | 239,593 | 274,596 | 915,825 | 915,513 |

[1] Removals in 1979 are trend-level removals.

[2] Figures have been adjusted from those published after the 1966 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

[3] International 1/4-inch rule.

[4] Includes black cherry.

Table 57.--Timber removals[1] from growing stock and sawtimber on commercial forest land by item and species category, Michigan, 1979

| Item | Growing stock | | | | | | Sawtimber | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods | All species | Pine | Other softwoods | Aspen | Hard maple | Other hardwoods |
| | - - - - - - - - - Thousand cubic feet- - - - - - - - - | | | | | | - - - - - - - - - - Thousand board feet[2] - - - - - - - - - | | | | | |
| ROUNDWOOD PRODUCTS | | | | | | | | | | | | |
| Pulpwood | 104,681 | 19,088 | 13,595 | 42,833 | 4,003 | 25,162 | 197,015 | 44,432 | 36,169 | 72,275 | 10,614 | 33,525 |
| Saw logs | 93,845 | 7,543 | 3,386 | 21,913 | 16,275 | 44,728 | 513,306 | 43,215 | 18,591 | 106,807 | 98,853 | 245,840 |
| Fuelwood | 8,324 | 16 | 23 | 553 | 1,617 | 6,115 | 27,425 | 103 | 96 | 1,816 | 5,311 | 20,099 |
| Posts | 2,602 | -- | 2,591 | -- | -- | 11 | 2,740 | -- | 2,674 | -- | -- | 66 |
| Veneer logs | 4,796 | 4 | -- | 2,187 | 1,200 | 1,405 | 35,030 | 28 | -- | 15,983 | 8,748 | 10,271 |
| Poles | 78 | 78 | -- | -- | -- | -- | 313 | 313 | -- | -- | -- | -- |
| Other[3] | 8,722 | 229 | 605 | 6,569 | 30 | 1,289 | 15,648 | 715 | 1,971 | 11,265 | 193 | 1,504 |
| Total | 223,048 | 26,958 | 20,200 | 74,055 | 23,125 | 78,710 | 791,477 | 88,806 | 59,501 | 208,146 | 123,719 | 311,305 |
| LOGGING RESIDUE | 16,758 | 1,067 | 1,281 | 4,042 | 2,848 | 7,520 | 34,052 | 1,169 | 3,101 | 4,166 | 7,725 | 17,891 |
| OTHER REMOVALS | 34,790 | 1,062 | 5,799 | 5,098 | 6,298 | 16,533 | 89,984 | 2,620 | 9,996 | 12,489 | 16,632 | 48,247 |
| ALL REMOVALS | 274,596 | 29,087 | 27,280 | 83,195 | 32,271 | 102,763 | 915,513 | 92,595 | 72,598 | 224,801 | 148,076 | 377,443 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes charcoal wood, shingle bolts, cabin logs, particleboard bolts, piling, etc.

[4] Less than 500 cubic feet.

Table 58.--Net annual growth and removals[1] of growing stock on commercial forest land by species group, Michigan, 1979

(In thousand cubic feet)

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 19,345 | 5,097 |
| Red pine | 44,857 | 7,798 |
| Jack pine | 26,700 | 16,192 |
| White spruce | 23,053 | 2,194 |
| Black spruce | 12,587 | 2,441 |
| Balsam fir | 24,608 | 8,931 |
| Hemlock | 10,814 | 6,633 |
| Tamarack | 161 | 772 |
| Northern white-cedar | 39,369 | 6,088 |
| Other softwoods | 3,977 | 221 |
| Total | 205,471 | 56,367 |
| HARDWOODS | | |
| Select white oaks | 12,566 | 8,984 |
| Select red oaks | 33,886 | 20,599 |
| Other red oaks | 8,388 | 6,073 |
| Hickory | 2,871 | 647 |
| Yellow birch | 9,329 | 4,894 |
| Hard maple | 94,457 | 32,271 |
| Soft maple | 113,426 | 23,982 |
| Beech | 6,163 | 5,840 |
| Ash | 39,045 | 5,614 |
| Balsam poplar | 4,481 | 2,370 |
| Cottonwood | 2,500 | 1,291 |
| Bigtooth aspen | 36,330 | 31,390 |
| Quaking aspen | 52,163 | 51,805 |
| Basswood | 22,318 | 4,794 |
| Black walnut | 796 | 205 |
| Elm | -12,374 | 6,997 |
| Paper birch | 25,532 | 7,734 |
| Other hardwoods[2] | 20,409 | 2,739 |
| Total | 472,286 | 218,229 |
| All species | 677,757 | 274,596 |

[1] Removals in 1979 are trend-level removals.

[2] Includes black cherry, butternut, and yellow-poplar.

## Table 59.--Net annual growth and removals[1] of sawtimber on commercial forest land by species group, Michigan, 1979

(In thousand board feet)[2]

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| White pine | 108,617 | 24,939 |
| Red pine | 117,205 | 27,365 |
| Jack pine | 104,334 | 40,291 |
| White spruce | 95,051 | 9,166 |
| Black spruce | 10,896 | 2,830 |
| Balsam fir | 66,895 | 23,301 |
| Hemlock | 63,350 | 23,663 |
| Tamarack | 5,070 | 766 |
| Northern white-cedar | 105,695 | 12,847 |
| Other softwoods | 9,741 | 25 |
| Total | 686,854 | 165,193 |
| HARDWOODS | | |
| Select white oaks | 68,022 | 39,366 |
| Select red oaks | 186,674 | 79,627 |
| Other red oaks | 36,495 | 24,026 |
| Hickory | 15,022 | 3,229 |
| Yellow birch | 32,273 | 19,913 |
| Hard maple | 288,837 | 148,076 |
| Soft maple | 301,091 | 73,409 |
| Beech | 24,013 | 29,468 |
| Ash | 109,978 | 23,877 |
| Balsam poplar | 25,884 | 5,483 |
| Cottonwood | 9,610 | 6,535 |
| Bigtooth aspen | 143,373 | 80,876 |
| Quaking aspen | 250,279 | 143,925 |
| Basswood | 95,669 | 22,633 |
| Black walnut | 2,089 | 1,134 |
| Elm | -13,924 | 23,142 |
| Paper birch | 65,409 | 16,538 |
| Other hardwoods[3] | 56,724 | 9,063 |
| Total | 1,697,518 | 750,320 |
| All species | 2,384,372 | 915,513 |

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[1] Removals in 1979 are trend-level removals.

[2] International ¼-inch rule.

[3] Includes black cherry, butternut, and yellow-poplar.

Table 60.--Net annual growth and removals[1] of growing stock on commercial forest land by ownership class and softwoods and hardwoods, Michigan, 1979

(In thousand cubic feet)

| | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| Ownership class | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 89,500 | 44,474 | 45,026 | 27,203 | 9,655 | 17,548 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 823 | 433 | 390 | 138 | 103 | 35 |
| Indian | 794 | 167 | 627 | 162 | 11 | 151 |
| State | 133,768 | 51,296 | 82,472 | 33,896 | 10,325 | 23,571 |
| County and municipal | 7,830 | 2,293 | 5,537 | 1,024 | 214 | 810 |
| Forest industry | 80,519 | 26,625 | 53,894 | 30,900 | 7,039 | 23,861 |
| Farmer and other[2] | 364,523 | 80,183 | 284,340 | 181,273 | 29,020 | 152,253 |
| All owners | 677,757 | 205,471 | 472,286 | 274,596 | 56,367 | 218,229 |

[1] Removals in 1979 are trend-level removals.

[2] Includes miscellaneous private-corporation and miscellaneous private-indivdual.

Table 61.--Net annual growth and removals[1] of sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Michigan, 1979

(In thousand board feet)[2]

| | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| Ownership class | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| National Forest | 309,084 | 142,924 | 166,160 | 62,708 | 25,161 | 37,547 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 4,763 | 3,797 | 966 | 324 | 244 | 80 |
| Indian | 2,085 | 741 | 1,344 | 315 | 22 | 293 |
| State | 463,560 | 185,412 | 278,148 | 89,409 | 28,220 | 61,189 |
| County and municipal | 30,494 | 8,509 | 21,985 | 2,392 | 456 | 1,936 |
| Forest industry | 292,382 | 91,130 | 201,252 | 103,095 | 22,971 | 80,124 |
| Farmer and other[3] | 1,282,004 | 254,341 | 1,027,663 | 657,270 | 88,119 | 569,151 |
| All owners | 2,384,372 | 686,854 | 1,697,518 | 915,513 | 165,193 | 750,320 |

[1] Removals in 1979 are trend-level removals.

[2] International 1/4-inch rule.

[3] Includes miscellaneous private-corporation and miscellaneous private-individual.

Table 62.--Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, Michigan, 1965 and 1979

(In million cubic feet)

| Species | [1] 1965 | 1979 |
|---|---|---|
| Softwoods | 29.3 | 41.1 |
| Hardwoods | 80.3 | 117.1 |
| Total | 109.6 | 158.2 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1979 volumes because of changes in survey definitions and procedures.

Table 63.--Annual mortality of growing stock on commercial forest land by species group and cause, Michigan, 1979

(In thousand cubic feet)

| Species group | All causes | Cause<br>Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| White pine | 888 | 5 | 309 | 9 | -- | 164 | 17 | 384 |
| Red pine | 72 | -- | 38 | -- | -- | 2 | 7 | 25 |
| Jack pine | 2,430 | 55 | 388 | -- | 80 | 137 | 31 | 1,739 |
| White spruce | 1,799 | 163 | 153 | -- | -- | 415 | 9 | 1,059 |
| Black spruce | 2,899 | 460 | 584 | 18 | 10 | 287 | 10 | 1,530 |
| Balsam fir | 23,959 | 3,496 | 4,125 | -- | 55 | 3,710 | 69 | 12,504 |
| Hemlock | 636 | 12 | 141 | -- | -- | 59 | 3 | 421 |
| Tamarack | 4,515 | 108 | 761 | 86 | 142 | 60 | -- | 3,358 |
| Northern white-cedar | 3,708 | 15 | 900 | -- | 40 | 1,038 | 31 | 1,684 |
| Other softwoods | 179 | -- | -- | -- | -- | -- | -- | 179 |
| Total | 41,085 | 4,314 | 7,399 | 113 | 327 | 5,872 | 177 | 22,883 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 976 | 35 | 210 | -- | -- | -- | -- | 731 |
| Select red oaks | 5,237 | 137 | 633 | -- | 1 | 177 | 68 | 4,221 |
| Other red oaks | 1,239 | -- | 245 | -- | -- | -- | -- | 994 |
| Hickory | 147 | -- | -- | -- | -- | 39 | -- | 108 |
| Yellow birch | 3,389 | -- | 1,351 | -- | -- | 158 | -- | 1,880 |
| Hard maple | 11,723 | -- | 4,218 | -- | 216 | 2,484 | 210 | 4,595 |
| Soft maple | 4,614 | -- | 1,032 | -- | 36 | 1,074 | -- | 2,472 |
| Beech | 2,735 | -- | -- | -- | -- | 1,098 | -- | 1,637 |
| Ash | 4,053 | 263 | 873 | -- | -- | 708 | 73 | 2,136 |
| Balsam poplar | 5,053 | -- | 1,875 | -- | -- | 534 | -- | 2,644 |
| Cottonwood | 149 | -- | 30 | -- | -- | 1 | 26 | 92 |
| Bigtooth aspen | 12,045 | -- | 6,060 | -- | -- | 941 | 95 | 4,949 |
| Quaking aspen | 32,447 | 43 | 15,076 | -- | 506 | 4,798 | 69 | 11,955 |
| Basswood | 2,374 | -- | 767 | -- | -- | 259 | -- | 1,348 |
| Yellow-poplar | 46 | -- | -- | -- | -- | -- | -- | 46 |
| Black walnut | 101 | -- | -- | -- | -- | -- | -- | 101 |
| Black cherry | 489 | -- | 32 | -- | -- | 59 | -- | 398 |
| Butternut | 10 | -- | -- | -- | -- | -- | -- | 10 |
| Elm | 26,427 | 94 | 20,540 | -- | 9 | 32 | -- | 5,752 |
| Paper birch | 3,218 | -- | 1,073 | -- | 15 | 188 | 15 | 1,927 |
| Other hardwoods | 594 | -- | 185 | -- | -- | 287 | -- | 122 |
| Total | 117,066 | 572 | 54,200 | -- | 783 | 12,837 | 556 | 48,118 |
| All species | 158,151 | 4,886 | 61,599 | 113 | 1,110 | 18,709 | 733 | 71,001 |

Table 64.--Annual mortality of sawtimber on commercial forest land by species group and cause, Michigan, 1979

(In thousand board feet)[1/]

| Species group | All causes | Cause | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS | | | | | | | | |
| White pine | 3,714 | 25 | 1,291 | -- | -- | 732 | -- | 1,666 |
| Red pine | -- | -- | -- | -- | -- | -- | -- | -- |
| Jack pine | 6,317 | 111 | 1,634 | -- | 301 | 149 | 206 | 3,916 |
| White spruce | 6,842 | 765 | 735 | -- | -- | 2,008 | -- | 3,334 |
| Black spruce | 6,901 | 1,669 | 2,067 | -- | -- | 138 | 104 | 2,923 |
| Balsam fir | 38,545 | 3,823 | 7,079 | -- | 198 | 8,716 | -- | 18,729 |
| Hemlock | 2,856 | 62 | 674 | -- | -- | 277 | -- | 1,843 |
| Tamarack | 7,194 | 197 | 1,650 | -- | -- | -- | -- | 5,347 |
| Northern white-cedar | 8,312 | 61 | 2,130 | -- | 44 | 1,999 | -- | 4,078 |
| Other softwoods | 114 | -- | -- | -- | -- | -- | -- | 114 |
| Total | 80,795 | 6,713 | 17,260 | -- | 543 | 14,019 | 310 | 41,950 |
| HARDWOODS | | | | | | | | |
| Select white oaks | 1,455 | -- | 1,432 | -- | -- | 1 | -- | 22 |
| Select red oaks | 16,788 | -- | 3,061 | -- | 4 | 208 | -- | 13,515 |
| Other red oaks | 3,087 | -- | 1,146 | -- | -- | -- | -- | 1,941 |
| Hickory | 237 | -- | -- | -- | -- | 11 | -- | 226 |
| Yellow birch | 12,783 | -- | 5,077 | -- | -- | 1,090 | -- | 6,616 |
| Hard maple | 28,195 | -- | 11,686 | -- | -- | 6,426 | -- | 10,083 |
| Soft maple | 9,222 | -- | 1,694 | -- | -- | 2,392 | -- | 5,136 |
| Beech | 9,820 | -- | 2 | -- | -- | 4,412 | -- | 5,406 |
| Ash | 7,743 | -- | 3,172 | -- | -- | 3,081 | -- | 1,490 |
| Balsam poplar | 16,604 | -- | 6,484 | -- | -- | 2,569 | -- | 7,551 |
| Cottonwood | 329 | -- | 13 | -- | -- | -- | -- | 316 |
| Bigtooth aspen | 25,400 | -- | 13,006 | -- | -- | 3,255 | -- | 9,139 |
| Quaking aspen | 62,885 | -- | 23,684 | -- | 1,638 | 14,102 | -- | 23,461 |
| Basswood | 6,205 | -- | 2,651 | -- | -- | 796 | -- | 2,758 |
| Yellow-poplar | 187 | -- | -- | -- | -- | -- | -- | 187 |
| Black walnut | 305 | -- | -- | -- | -- | -- | -- | 305 |
| Black cherry | 449 | -- | 30 | -- | -- | 172 | -- | 247 |
| Butternut | 28 | -- | -- | -- | -- | -- | -- | 28 |
| Elm | 52,701 | 193 | 39,570 | -- | -- | 29 | -- | 12,909 |
| Paper birch | 4,013 | -- | 1,584 | -- | -- | 681 | -- | 1,748 |
| Other hardwoods | 915 | -- | 422 | -- | -- | 491 | -- | 2 |
| Total | 259,351 | 193 | 114,714 | -- | 1,642 | 39,716 | -- | 103,086 |
| All species | 340,146 | 6,906 | 131,974 | -- | 2,185 | 53,735 | 310 | 145,036 |

[1/] International 1/4-inch rule.

Table 65.--Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Michigan, 1979

| Ownership class | Growing stock | | | Sawtimber | | |
|---|---|---|---|---|---|---|
| | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| | - - - - Thousand cubic feet - - - - | | | - - - Thousand board feet[1/] - - - | | |
| National Forest | 18,939 | 5,597 | 13,342 | 39,090 | 12,741 | 26,349 |
| Bureau of Land Management | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 361 | 48 | 313 | 679 | 106 | 573 |
| Indian | 220 | 36 | 184 | 770 | 89 | 681 |
| State | 31,065 | 10,760 | 20,305 | 62,254 | 19,631 | 42,623 |
| County and municipal | 1,392 | 241 | 1,151 | 2,686 | 469 | 2,217 |
| Forest industry | 18,666 | 6,596 | 12,070 | 46,882 | 12,756 | 34,126 |
| Farmer | 29,861 | 4,771 | 25,090 | 59,611 | 7,038 | 52,573 |
| Misc. private-corp. | 14,768 | 4,525 | 10,243 | 38,041 | 12,342 | 25,699 |
| Misc. private-indiv. | 42,879 | 8,511 | 34,368 | 90,133 | 15,623 | 74,510 |
| All owners | 158,151 | 41,085 | 117,066 | 340,146 | 80,795 | 259,351 |

[1/] International 1/4-inch rule.

Table 66.--Output of timber products by product, softwoods and hardwoods, and source of material, Michigan, 1978

| Product | Standard units | Total |  | Roundwood products |  |  |  | Plant byproducts |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  | Growing stock |  | Nongrowing stock |  |  |  |
|  |  | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet |
| PULPWOOD |  |  |  |  |  |  |  |  |  |
| Softwood | [1]Standard cords | 480,169 | 37,891 | 414,188 | 32,683 | 48,804 | 3,851 | 17,177 | 1,357 |
| Hardwood |  | 1,194,803 | 94,281 | 912,547 | 71,998 | 152,373 | 12,023 | 129,883 | 10,260 |
| Total |  | 1,674,972 | 132,172 | 1,326,735 | 104,681 | 201,177 | 15,874 | 147,060 | 11,617 |
| SAW LOGS |  |  |  |  |  |  |  |  |  |
| Softwood | [2]Thousand board feet | 65,120 | 11,290 | 63,042 | 10,929 | 2,078 | 361 | -- | -- |
| Hardwood |  | 498,203 | 85,709 | 481,987 | 82,916 | 16,216 | 2,793 | -- | -- |
| Total |  | 563,323 | 96,999 | 545,029 | 93,845 | 18,294 | 3,154 | -- | -- |
| VENEER LOGS |  |  |  |  |  |  |  |  |  |
| Softwood | [2]Thousand board feet | 28 | 4 | 28 | 4 | -- | -- | -- | -- |
| Hardwood |  | 35,002 | 4,792 | 35,002 | 4,792 | -- | -- | -- | -- |
| Total |  | 35,030 | 4,796 | 35,030 | 4,796 | -- | -- | -- | -- |
| FUELWOOD |  |  |  |  |  |  |  |  |  |
| Softwood | [1]Standard cords | 23,398 | 1,583 | 717 | 39 | 2,601 | 138 | 20,080 | 1,406 |
| Hardwood |  | 602,283 | 42,061 | 118,740 | 8,285 | 320,451 | 22,359 | 163,092 | 11,417 |
| Total |  | 625,681 | 43,644 | 119,457 | 8,324 | 323,052 | 22,497 | 183,172 | 12,823 |
| POSTS |  |  |  |  |  |  |  |  |  |
| Softwood | Thousand pieces | 2,777 | 2,846 | 2,528 | 2,591 | 249 | 255 | -- | -- |
| Hardwood |  | 7 | 11 | 7 | 11 | -- | -- | -- | -- |
| Total |  | 2,784 | 2,857 | 2,535 | 2,602 | 249 | 255 | -- | -- |
| POLES |  |  |  |  |  |  |  |  |  |
| Softwood | Pieces | 9,196 | 78 | 9,196 | 78 | -- | -- | -- | -- |
| Hardwood |  | -- | -- | -- | -- | -- | -- | -- | -- |
| Total |  | 9,196 | 78 | 9,196 | 78 | -- | -- | -- | -- |
| OTHER[3] |  |  |  |  |  |  |  |  |  |
| Softwood | Thousand cubic feet | 1,300 | 1,300 | 834 | 834 | 52 | 52 | 414 | 414 |
| Hardwood |  | 20,894 | 20,894 | 7,888 | 7,888 | 1,007 | 1,007 | 11,999 | 11,999 |
| Total |  | 22,194 | 22,194 | 8,722 | 8,722 | 1,059 | 1,059 | 12,413 | 12,413 |
| ALL PRODUCTS |  |  |  |  |  |  |  |  |  |
| Softwood | Thousand cubic feet | -- | 54,992 | -- | 47,158 | -- | 4,657 | -- | 3,177 |
| Hardwood |  | -- | 247,748 | -- | 175,890 | -- | 38,182 | -- | 33,676 |
| Total |  | -- | 302,740 | -- | 223,048 | -- | 42,839 | -- | 36,853 |

[1] Rough-wood, 128 cubic foot basis.

[2] International 1/4-inch rule.

[3] Other (industrial production) includes cabin logs, charcoal wood, particleboard bolts, shingle bolts, pilings, etc.

Table 67.--Output of roundwood products by product, softwoods and hardwoods, and source of material, Michigan, 1978

(In thousand cubic feet)

| Product and species group | All sources | Growing-stock trees |  |  | Rough and rotten trees | Salvable dead trees | Other sources |
|---|---|---|---|---|---|---|---|
|  |  | Total | Sawtimber | Poletimber |  |  |  |
| INDUSTRIAL PRODUCTS |  |  |  |  |  |  |  |
| Saw logs |  |  |  |  |  |  |  |
| Softwood | 11,290 | 10,929 | 10,762 | 167 | 6 | 139 | 216 |
| Hardwood | 85,709 | 82,916 | 77,663 | 5,253 | 806 | 361 | 1,626 |
| Subtotal | 96,999 | 93,845 | 88,425 | 5,420 | 812 | 500 | 1,842 |
| Veneer logs and bolts |  |  |  |  |  |  |  |
| Softwood | 4 | 4 | 4 | -- | -- | -- | -- |
| Hardwood | 4,792 | 4,792 | 4,792 | -- | -- | -- | -- |
| Subtotal | 4,796 | 4,796 | 4,796 | -- | -- | -- | -- |
| Pulpwood |  |  |  |  |  |  |  |
| Softwood | 36,534 | 32,683 | 20,847 | 11,836 | 703 | 943 | 2,205 |
| Hardwood | 84,021 | 71,998 | 29,938 | 42,060 | 5,873 | 957 | 5,193 |
| Subtotal | 120,555 | 104,681 | 50,785 | 53,896 | 6,576 | 1,900 | 7,398 |
| Cooperage |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | -- | -- | -- | -- | -- | -- | -- |
| Piling |  |  |  |  |  |  |  |
| Softwood | 9 | 9 | 9 | -- | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 9 | 9 | 9 | -- | -- | -- | -- |
| Poles |  |  |  |  |  |  |  |
| Softwood | 78 | 78 | 64 | 14 | -- | -- | -- |
| Hardwood | -- | -- | -- | -- | -- | -- | -- |
| Subtotal | 78 | 78 | 64 | 14 | -- | -- | -- |
| Mine timbers (Round) |  |  |  |  |  |  |  |
| Softwood | 14 | 11 | 9 | 2 | -- | 3 | -- |
| Hardwood | 30 | 30 | 30 | -- | -- | -- | -- |
| Subtotal | 44 | 41 | 39 | 2 | -- | 3 | -- |
| Posts (Round and split) |  |  |  |  |  |  |  |
| Softwood | 2,846 | 2,591 | 687 | 1,904 | 30 | -- | 225 |
| Hardwood | 11 | 11 | 11 | -- | -- | -- | -- |
| Subtotal | 2,857 | 2,602 | 698 | 1,904 | 30 | -- | 225 |
| Other |  |  |  |  |  |  |  |
| Softwood | 863 | 814 | 497 | 317 | -- | 7 | 42 |
| Hardwood | 8,865 | 7,858 | 3,135 | 4,723 | 288 | 87 | 632 |
| Subtotal | 9,728 | 8,672 | 3,632 | 5,040 | 288 | 94 | 674 |
| All industrial products |  |  |  |  |  |  |  |
| Softwood | 51,638 | 47,119 | 32,879 | 14,240 | 739 | 1,092 | 2,688 |
| Hardwood | 183,428 | 167,605 | 115,569 | 52,036 | 6,967 | 1,405 | 7,451 |
| Total | 235,066 | 214,724 | 148,448 | 66,276 | 7,706 | 2,497 | 10,139 |
| FUELWOOD |  |  |  |  |  |  |  |
| Softwood | 177 | 39 | 24 | 15 | 5 | 2 | 131 |
| Hardwood | 30,644 | 8,285 | 4,817 | 3,468 | 1,735 | 143 | 20,481 |
| Total | 30,821 | 8,324 | 4,841 | 3,483 | 1,740 | 145 | 20,612 |
| ALL PRODUCTS |  |  |  |  |  |  |  |
| Softwood | 51,815 | 47,158 | 32,903 | 14,255 | 744 | 1,094 | 2,819 |
| Hardwood | 214,072 | 175,890 | 120,386 | 55,504 | 8,702 | 1,548 | 27,932 |
| Total | 265,887 | 223,048 | 153,289 | 69,759 | 9,446 | 2,642 | 30,751 |

Table 68.--Timber products from roundwood by species group and product, Michigan, 1978

| Species group | All products | Pulpwood | | Saw logs | | Veneer logs | |
|---|---|---|---|---|---|---|---|
| | Thousand cubic feet | Cords | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 4,611 | 10,836 | 850 | 22,276 | 3,726 | 1 | -- |
| Red pine | 8,175 | 74,037 | 5,842 | 13,231 | 2,205 | 27 | 4 |
| Jack pine | 17,288 | 192,007 | 15,167 | 9,821 | 1,840 | -- | -- |
| White spruce | 1,865 | 20,603 | 1,623 | 886 | 163 | -- | -- |
| Black spruce | 1,981 | 21,892 | 1,726 | 884 | 163 | -- | -- |
| Balsam fir | 8,126 | 87,342 | 6,893 | 3,396 | 641 | -- | -- |
| Hemlock | 5,346 | 48,413 | 3,822 | 8,907 | 1,493 | -- | -- |
| Tamarack | 176 | 1,750 | 133 | 221 | 42 | -- | -- |
| Northern white-cedar | 4,247 | 6,112 | 478 | 5,498 | 1,017 | -- | -- |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 51,815 | 462,992 | 36,534 | 65,120 | 11,290 | 28 | 4 |
| HARDWOODS | | | | | | | |
| Select white oaks | 8,912 | 18,773 | 1,463 | 29,105 | 5,096 | 615 | 84 |
| Select red oaks | 24,248 | 77,059 | 6,077 | 77,635 | 13,622 | 2,205 | 302 |
| Other red oaks | 4,516 | 8,182 | 645 | 15,860 | 2,784 | 411 | 56 |
| Hickory | 712 | -- | -- | 1,435 | 232 | 43 | 4 |
| Yellow birch | 3,664 | 22,395 | 1,766 | 8,087 | 1,357 | 2,839 | 389 |
| Hard maple | 30,547 | 82,203 | 6,486 | 104,075 | 16,843 | 8,748 | 1,200 |
| Soft maple | 21,097 | 120,135 | 9,478 | 47,465 | 8,321 | 594 | 80 |
| Beech | 4,690 | 10,587 | 832 | 17,987 | 3,008 | 1,148 | 158 |
| Ash | 5,629 | 11,072 | 865 | 18,664 | 3,253 | 178 | 24 |
| Balsam poplar | 2,308 | 25,297 | 1,994 | 1,450 | 252 | -- | -- |
| Cottonwood | 1,182 | -- | -- | 5,848 | 1,018 | 226 | 31 |
| Bigtooth aspen | 28,263 | 181,505 | 14,336 | 52,115 | 9,158 | 2,468 | 338 |
| Quaking aspen | 51,846 | 404,103 | 31,919 | 74,963 | 13,177 | 13,515 | 1,849 |
| Basswood | 3,852 | 4,276 | 336 | 19,364 | 3,379 | 521 | 74 |
| Black walnut | 236 | -- | -- | 855 | 139 | 173 | 22 |
| Elm | 9,083 | 25,975 | 2,053 | 12,481 | 2,186 | 241 | 33 |
| Paper birch | 8,352 | 67,324 | 5,304 | 6,646 | 1,164 | 1,004 | 138 |
| Other hardwoods[2] | 4,935 | 6,034 | 467 | 4,168 | 720 | 73 | 10 |
| Total | 214,072 | 1,064,920 | 84,021 | 498,203 | 85,709 | 35,002 | 4,792 |
| All species | 265,887 | 1,527,912 | 120,555 | 563,323 | 96,999 | 35,030 | 4,796 |

(Table 68 continued on next page)

[1] International 1/4-inch rule.

[2] Includes black cherry, butternut, and yellow-poplar.

(Table 68 continued)

| Species group | Fuelwood | | Posts | | Poles | | Other products |
|---|---|---|---|---|---|---|---|
| | Cords | Thousand cubic feet | Thousand pieces | Thousand cubic feet | Pieces | Thousand cubic feet | Thousand cubic feet |
| SOFTWOODS | | | | | | | |
| White pine | 644 | 35 | -- | -- | -- | -- | -- |
| Red pine | 313 | 10 | -- | -- | 8,606 | 73 | 41 |
| Jack pine | 753 | 39 | -- | -- | 590 | 5 | 237 |
| White spruce | 19 | -- | 61 | 61 | -- | -- | 18 |
| Black spruce | 24 | 1 | 73 | 73 | -- | -- | 18 |
| Balsam fir | 49 | 1 | 542 | 555 | -- | -- | 36 |
| Hemlock | 530 | 31 | -- | -- | -- | -- | -- |
| Tamarack | 52 | 1 | -- | -- | -- | -- | -- |
| Northern white-cedar | 934 | 59 | 2,101 | 2,157 | -- | -- | 536 |
| Other softwoods | -- | -- | -- | -- | -- | -- | -- |
| Total | 3,318 | 177 | 2,777 | 2,846 | 9,196 | 78 | 886 |
| HARDWOODS | | | | | | | |
| Select white oaks | 32,416 | 2,267 | -- | -- | -- | -- | 2 |
| Select red oaks | 55,899 | 3,896 | -- | -- | -- | -- | 351 |
| Other red oaks | 14,185 | 991 | -- | -- | -- | -- | 40 |
| Hickory | 6,858 | 476 | -- | -- | -- | -- | -- |
| Yellow birch | 2,235 | 152 | -- | -- | -- | -- | -- |
| Hard maple | 85,682 | 5,988 | -- | -- | -- | -- | 30 |
| Soft maple | 37,016 | 2,586 | -- | -- | -- | -- | 632 |
| Beech | 9,887 | 689 | -- | -- | -- | -- | 3 |
| Ash | 21,333 | 1,487 | -- | -- | -- | -- | -- |
| Balsam poplar | 884 | 62 | -- | -- | -- | -- | -- |
| Cottonwood | 1,903 | 133 | -- | -- | -- | -- | -- |
| Bigtooth aspen | 14,041 | 979 | -- | -- | -- | -- | 3,452 |
| Quaking aspen | 15,228 | 1,064 | -- | -- | -- | -- | 3,837 |
| Basswood | 968 | 63 | -- | -- | -- | -- | -- |
| Black walnut | 1,074 | 75 | -- | -- | -- | -- | -- |
| Elm | 68,873 | 4,811 | -- | -- | -- | -- | -- |
| Paper birch | 17,269 | 1,198 | -- | -- | -- | -- | 548 |
| Other hardwoods | 53,440 | 3,727 | 7 | 11 | -- | -- | -- |
| Total | 439,191 | 30,644 | 7 | 11 | -- | -- | 8,895 |
| All species | 442,509 | 30,821 | 2,784 | 2,857 | 9,196 | 78 | 9,781 |

Table 69.--Volume of primary plant residue by use and type of residue, Michigan, 1978

(In thousand cubic feet)

| Use | Wood residue | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Coarse[1] | | Fine[2] | | Bark[3] | |
| | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood |
| Fiber products[4] | 1,194.8 | 14,899.7 | 1,147.9 | 14,584.1 | 46.9 | 315.6 | 30.5 | 579.9 |
| Charcoal | -- | -- | -- | -- | -- | -- | -- | 3.0 |
| Industrial fuel | 702.7 | 4,478.6 | 167.7 | 767.7 | 535.0 | 3,710.9 | 696.8 | 3,650.4 |
| Domestic fuel | 701.7 | 6,937.4 | 699.9 | 6,859.5 | 1.8 | 77.9 | 232.5 | 3,596.3 |
| Miscellaneous[5] | 414.4 | 7,358.8 | 19.8 | 406.6 | 394.6 | 6,952.2 | 186.5 | 3,941.3 |
| Not used[6] | 773.2 | 5,323.9 | 356.2 | 1,303.0 | 417.0 | 4,020.9 | 613.6 | 3,957.6 |
| Total | 3,786.8 | 38,998.4 | 2,391.5 | 23,920.9 | 1,395.3 | 15,077.5 | 1,759.9 | 15,728.5 |

[1] Suitable for chipping such as slabs, edgings, veneer cores, etc.

[2] Not suitable for chipping such as sawdust, veneer clippings, etc.

[3] Does not include bark disposal at pulpmills.

[4] For manufacture of pulp, hardboard, or roofing felt.

[5] Livestock bedding, mulch, small dimension, and specialty items.

[6] Includes residue burned as waste.

Table 70.--All live shrub[1/] biomass yields on commercial forest land by shrub species group and forest type, Michigan, 1980

(In pounds per acre)

| | Forest type | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shrub species group | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| TALL SHRUBS | | | | | | | | | | | | | | | |
| Balsam fir | 4 | 27 | 125 | 587 | 66 | 181 | 317 | 145 | 10 | 72 | 71 | 125 | 285 | -- | -- |
| Tamarack | -- | -- | -- | 14 | 13 | 10 | 8 | 81 | -- | 2 | -- | 1 | 15 | -- | -- |
| White spruce | -- | -- | -- | 48 | 43 | -- | 13 | -- | 2 | 4 | 4 | 5 | 35 | -- | -- |
| Black spruce | 17 | 7 | 3 | 71 | -- | 476 | 46 | 167 | -- | 4 | -- | 2 | 1 | -- | -- |
| Jack pine | 199 | 6 | -- | -- | -- | -- | -- | -- | 26 | -- | -- | 3 | -- | -- | 4 |
| Red pine | 8 | 27 | -- | -- | -- | -- | -- | -- | 3 | -- | 1 | -- | -- | -- | -- |
| White pine | 13 | 22 | 122 | 7 | -- | 1 | -- | 6 | 34 | -- | 2 | 6 | 14 | -- | -- |
| Scotch pine | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 94 | -- |
| Northern white-cedar | -- | -- | -- | 306 | 7 | 9 | 315 | 22 | -- | 15 | 16 | 15 | 27 | -- | -- |
| Hemlock | -- | -- | -- | 8 | -- | -- | -- | -- | -- | 5 | 11 | -- | 1 | -- | -- |
| Boxelder | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- |
| Striped maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5 | 1 | 3 | -- | -- |
| Red maple | 11 | 48 | 55 | 37 | 153 | 29 | 56 | 29 | 85 | 109 | 102 | 143 | 53 | 3 | -- |
| Silver maple | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 10 | -- | 3 | -- | -- | -- |
| Sugar maple | -- | 15 | 68 | 29 | 55 | 52 | 9 | -- | 8 | 25 | 480 | 39 | 22 | -- | -- |
| Mountain maple | -- | -- | -- | 103 | 86 | -- | 32 | 2 | -- | 76 | 32 | 21 | 145 | -- | -- |
| Red alder | -- | -- | 7 | -- | -- | -- | -- | -- | -- | -- | -- | 3 | -- | -- | -- |
| Green alder | 34 | -- | -- | -- | -- | 40 | -- | -- | 3 | -- | -- | 1 | 44 | -- | -- |
| Speckled alder | 71 | 24 | 118 | 644 | 260 | 1,703 | 433 | 2,607 | 13 | 607 | 35 | 134 | 283 | -- | 369 |
| Yellow birch | -- | -- | -- | 5 | -- | -- | -- | -- | -- | 5 | 15 | 3 | -- | 16 | -- |
| Paper birch | 1 | -- | 1 | 10 | 31 | -- | 6 | -- | -- | 8 | 6 | 7 | 12 | -- | -- |
| Swamp birch | -- | -- | -- | -- | -- | 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| American hornbeam | -- | 30 | -- | -- | -- | -- | -- | -- | 5 | 11 | 6 | 1 | 1 | -- | -- |
| Dogwood | 1 | 1 | 93 | 68 | 15 | 49 | 110 | 38 | 45 | 219 | 27 | 126 | 200 | 1 | 36 |
| Flowering dogwood | -- | -- | -- | -- | -- | 3 | -- | -- | 4 | -- | 1 | -- | -- | -- | -- |
| Hawthorn | 6 | 21 | -- | -- | -- | -- | -- | -- | 8 | 3 | 2 | 3 | -- | -- | 46 |
| Beech | -- | 6 | -- | -- | -- | -- | -- | -- | 1 | 2 | 24 | 2 | -- | -- | -- |
| White ash | -- | 2 | -- | -- | 1 | -- | -- | -- | 22 | 21 | 20 | 25 | 16 | 1 | -- |
| Black ash | -- | -- | -- | 28 | 1 | -- | 96 | 1 | -- | 155 | 9 | 21 | 7 | -- | -- |
| Green ash | -- | -- | -- | -- | -- | -- | 10 | -- | 1 | 45 | 4 | 11 | 2 | -- | -- |
| Black alder | -- | -- | -- | -- | -- | -- | 53 | 8 | -- | 32 | 3 | 1 | -- | -- | -- |
| Mountain holly | -- | -- | -- | -- | -- | 4 | -- | -- | -- | 16 | -- | -- | 1 | -- | -- |
| Spice bush | -- | -- | -- | -- | -- | -- | -- | -- | -- | 26 | 8 | -- | -- | -- | -- |
| Apple | -- | -- | -- | -- | -- | -- | -- | -- | 3 | -- | 1 | -- | -- | -- | -- |
| Eastern hophornbeam | -- | -- | 8 | -- | -- | -- | -- | -- | 14 | -- | 45 | 21 | 1 | 21 | -- |
| Balsam poplar | -- | -- | -- | 31 | 18 | -- | 20 | -- | -- | 6 | 1 | 18 | 10 | -- | -- |
| Bigtooth aspen | 1 | 10 | -- | -- | -- | -- | -- | -- | 7 | -- | 2 | 62 | 53 | 17 | -- |
| Quaking aspen | 4 | 27 | 1 | 3 | -- | 4 | 7 | 5 | 7 | 21 | 27 | 213 | 53 | 20 | -- |
| Pincherry | 12 | -- | -- | -- | 8 | -- | -- | -- | 5 | 1 | 1 | 3 | -- | -- | 1 |
| Black cherry | 27 | 36 | 30 | 21 | 16 | 8 | 2 | -- | 149 | 66 | 51 | 68 | 18 | 40 | 1 |
| Chokecherry | 6 | 2 | 5 | 5 | 83 | 6 | 4 | 17 | 13 | 17 | 9 | 32 | 7 | 4 | 1 |
| Sandcherry | 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 16 |
| Pawpaw | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- |
| White oak | 6 | 1 | 13 | -- | -- | -- | -- | -- | 67 | 1 | 4 | 5 | -- | 1 | -- |
| Northern pin oak | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern red oak | 62 | 35 | 4 | -- | -- | -- | -- | -- | 164 | 4 | 13 | 32 | 13 | 12 | 2 |
| Black oak | 8 | -- | -- | -- | -- | -- | -- | -- | 25 | -- | -- | 2 | -- | -- | -- |
| Sweet gale | -- | -- | -- | 34 | -- | -- | 4 | -- | -- | 22 | -- | -- | -- | -- | -- |

(Table 70 continued on next page)

(Table 70 continued)

| Shrub species group | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Forest type | | | | | | | | | | | | | | |
| Mountain ash | -- | -- | -- | -- | -- | 6 | 9 | -- | -- | 2 | 2 | 2 | -- | -- | -- |
| Witch hazel | -- | -- | 18 | 10 | 7 | 11 | -- | -- | 38 | 11 | 11 | 45 | 12 | -- | -- |
| Juneberry | 25 | 11 | 109 | 25 | 82 | 12 | 18 | 391 | 18 | 18 | 16 | 49 | 38 | 1 | 7 |
| Hazel | -- | 20 | 106 | 88 | 111 | -- | 162 | 45 | 21 | 86 | 113 | 115 | 48 | -- | -- |
| Prickly ash | -- | -- | -- | -- | -- | -- | -- | -- | 64 | 12 | 3 | -- | -- | -- | -- |
| Alder buckthorn | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 3 | -- | -- | -- | -- | -- |
| Leatherwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 1 | -- | -- | -- |
| Viburnum | 34 | 27 | -- | 239 | -- | 98 | 47 | 137 | 189 | 192 | 21 | 99 | 56 | -- | -- |
| Elder | -- | 6 | -- | -- | -- | -- | 2 | -- | 2 | 18 | 11 | 2 | -- | -- | 1 |
| Sumac | -- | 38 | -- | -- | -- | -- | 1 | -- | 10 | 7 | 7 | 18 | -- | 4 | 4 |
| Buffaloberry | -- | -- | -- | 3 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Buttonbush | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Willow | 57 | 23 | 1 | 105 | 246 | 4 | 43 | 408 | 1 | 89 | 9 | 61 | 69 | 41 | 20 |
| Sassafras | -- | 2 | -- | -- | -- | -- | -- | -- | 32 | 1 | 6 | 2 | -- | -- | -- |
| American basswood | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 4 | 10 | 2 | 1 | -- | -- |
| American elm | 12 | -- | -- | 2 | -- | -- | -- | -- | 4 | 56 | 15 | 4 | 78 | 1 | -- |
| Slippery elm | -- | -- | -- | -- | -- | -- | -- | -- | 6 | 2 | 1 | -- | -- | -- | -- |
| Rock elm | -- | -- | -- | -- | -- | -- | -- | -- | 6 | 11 | -- | -- | -- | -- | -- |
| Total | 620 | 474 | 887 | 2,534 | 1,302 | 2,717 | 1,827 | 4,109 | 1,117 | 2,124 | 1,266 | 1,559 | 1,624 | 277 | 508 |
| LOW SHRUBS | | | | | | | | | | | | | | | |
| Common juniper | -- | -- | 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Yew | -- | -- | -- | 4 | 1 | 1 | 2 | 2 | -- | -- | 3 | -- | -- | -- | -- |
| Holly | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 1 | -- | -- | -- | -- | -- |
| Virginia creeper | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 1 | -- | -- |
| Spirea | -- | -- | -- | -- | -- | -- | -- | 2 | -- | 7 | -- | -- | 1 | -- | 1 |
| Labrador tea | 13 | -- | 23 | 41 | 12 | 218 | 9 | 15 | -- | 41 | -- | -- | -- | -- | -- |
| Leatherleaf | 50 | -- | 151 | 67 | -- | 158 | 1 | 321 | 9 | 19 | -- | 17 | 66 | -- | -- |
| Bog laurel | 2 | -- | -- | -- | -- | 6 | 1 | 1 | -- | 1 | -- | -- | -- | -- | -- |
| Sweetfern | 48 | 13 | 1 | -- | 5 | 1 | -- | 1 | 18 | -- | 2 | 6 | -- | 5 | 7 |
| Gooseberry-currant | -- | -- | -- | 4 | -- | -- | 2 | 3 | 1 | 8 | -- | 2 | 1 | -- | 26 |
| Chokeberry | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Raspberry-blackberry | 8 | 31 | 38 | 26 | 5 | 9 | 9 | 29 | 25 | 22 | 29 | 39 | 42 | 102 | 69 |
| Rose | -- | -- | -- | 2 | -- | 1 | -- | -- | 2 | 2 | 1 | -- | -- | -- | -- |
| Black huckleberry | 4 | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- | -- |
| Bilberry-blueberry | 459 | 157 | 56 | 32 | 13 | 130 | 11 | 41 | 133 | 10 | 11 | 38 | 12 | -- | 35 |
| Bush honeysuckle | -- | 4 | 4 | 3 | 6 | -- | -- | 3 | 1 | 1 | -- | 2 | 2 | -- | -- |
| Honeysuckle | -- | 7 | 1 | 15 | 8 | 3 | 5 | 4 | 3 | 3 | 5 | 7 | 4 | -- | -- |
| Snowberry | -- | -- | -- | 2 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Shrubby cinquefoil | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| St. John's wort | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bearberry | 7 | 1 | -- | -- | -- | 2 | 1 | -- | -- | 1 | -- | -- | -- | -- | -- |
| Greenbriar | -- | -- | -- | -- | -- | -- | -- | -- | 4 | -- | -- | -- | -- | -- | -- |
| Bog rosemary | -- | -- | -- | -- | -- | 4 | -- | 2 | -- | -- | -- | 1 | -- | -- | -- |
| Grape | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3 | -- | -- | 1 | -- | -- |
| Total | 591 | 213 | 284 | 196 | 51 | 533 | 44 | 424 | 198 | 120 | 51 | 112 | 131 | 107 | 139 |
| All shrubs | 1,211 | 687 | 1,171 | 2,730 | 1,353 | 3,250 | 1,871 | 4,533 | 1,315 | 2,244 | 1,317 | 1,671 | 1,755 | 384 | 647 |
| Number of plots[2] | 188 | 107 | 62 | 90 | 101 | 115 | 246 | 28 | 435 | 325 | 1,883 | 916 | 108 | 30 | 37 |

---

[1] Trees under 1.0-inch d.b.h. are also included. Low shrub species that averaged less than 1.0 pound per acre are not included.

[2] Number of plots by forest type from which average yields were derived.

Table 71.--All live tree biomass yields on commercial forest land by species group and forest type, Michigan, 1980

(In pounds per acre)

| Species group | Forest type | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS | | | | | | | | | | | | | | | |
| White pine | 1,355 | 3,798 | 58,275 | 3,116 | 4,760 | 2,544 | 2,172 | 1,000 | 1,497 | 952 | 1,515 | 1,316 | 1,487 | 1,330 | 436 |
| Red pine | 6,001 | 72,119 | 9,585 | 526 | 1,367 | 1,079 | 120 | 141 | 1,654 | 152 | 335 | 1,279 | 1,018 | 6,407 | 297 |
| Jack pine | 60,033 | 9,261 | 2,017 | 155 | 901 | 3,562 | -- | 419 | 2,587 | 21 | 221 | 787 | 702 | 1,465 | 403 |
| White spruce | 45 | 333 | 2,908 | 12,051 | 40,173 | 745 | 2,261 | 47 | 74 | 733 | 928 | 1,465 | 2,421 | 410 | 11 |
| Black spruce | 1,265 | 314 | 2,471 | 4,486 | 2,074 | 36,702 | 6,103 | 6,460 | 19 | 403 | 151 | 402 | 653 | -- | 385 |
| Balsam fir | 107 | 652 | 6,782 | 41,314 | 12,220 | 6,344 | 15,197 | 3,692 | 121 | 3,849 | 3,581 | 5,868 | 10,739 | -- | 145 |
| Hemlock | -- | 210 | 982 | 1,517 | 157 | 430 | 1,271 | -- | 60 | 1,638 | 6,963 | 370 | 1,105 | -- | 4 |
| Tamarack | 19 | 34 | 242 | 963 | 543 | 3,707 | 3,949 | 42,978 | 4 | 449 | 36 | 175 | 522 | -- | 224 |
| Northern white-cedar | 8 | 169 | 1,045 | 8,044 | 8,755 | 5,381 | 68,426 | 5,480 | 15 | 4,565 | 1,669 | 2,432 | 6,684 | 62 | 72 |
| Other softwoods | -- | 540 | 3,333 | 10 | 2,918 | 11 | 155 | -- | 111 | 34 | 201 | 37 | -- | 68,786 | 35 |
| Total | 68,833 | 87,430 | 87,640 | 72,182 | 73,868 | 60,505 | 99,654 | 60,217 | 6,142 | 12,796 | 15,600 | 14,131 | 25,331 | 78,460 | 2,012 |
| HARDWOODS | | | | | | | | | | | | | | | |
| Select white oaks | 408 | 1,547 | 2,260 | -- | -- | -- | -- | -- | 29,727 | 2,164 | 1,290 | 873 | 256 | 570 | -- |
| Select red oaks | 4,906 | 2,752 | 4,286 | 84 | -- | -- | -- | -- | 46,814 | 1,068 | 4,031 | 4,301 | 2,590 | 2,032 | 92 |
| Other red oaks | 1,864 | 2,220 | -- | -- | -- | -- | -- | -- | 15,920 | 309 | 282 | 281 | -- | 595 | -- |
| Hickory | 39 | 87 | -- | -- | -- | -- | -- | -- | 4,356 | 284 | 759 | 16 | 47 | -- | -- |
| Yellow birch | -- | -- | 287 | 2,877 | 412 | 496 | 1,815 | -- | 81 | 3,086 | 8,834 | 380 | 1,067 | 137 | -- |
| Hard maple | 81 | 667 | 2,409 | 1,767 | 1,639 | 179 | 573 | -- | 1,096 | 1,944 | 52,558 | 2,917 | 6,220 | 1,399 | 358 |
| Soft maple | 1,092 | 2,260 | 6,761 | 8,384 | 3,933 | 2,028 | 4,758 | 853 | 8,563 | 35,934 | 21,587 | 9,520 | 12,829 | 383 | 316 |
| Beech | -- | 81 | 449 | 44 | 287 | -- | -- | -- | 272 | 254 | 6,375 | 275 | 489 | -- | 15 |
| Ash | -- | 106 | 217 | 1,517 | 145 | 394 | 4,491 | 307 | 1,730 | 22,512 | 6,033 | 1,942 | 2,562 | 88 | 408 |
| Balsam poplar | -- | 11 | 145 | 1,757 | 2,091 | 347 | 2,131 | 629 | 25 | 1,101 | 244 | 4,059 | 1,444 | 1,316 | 132 |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | 308 | 2,342 | 309 | 274 | -- | -- | -- |
| Bigtooth aspen | 576 | 1,970 | 1,576 | 359 | 163 | 288 | 374 | -- | 5,788 | 537 | 2,386 | 16,310 | 2,945 | 1,324 | 203 |
| Quaking aspen | 1,857 | 3,549 | 6,956 | 9,619 | 17,267 | 4,752 | 2,643 | 1,286 | 1,731 | 4,226 | 5,224 | 32,421 | 9,503 | 3,857 | 556 |
| Basswood | 55 | 82 | 69 | 47 | 68 | -- | 142 | -- | 511 | 1,722 | 8,003 | 582 | 1,221 | 364 | -- |
| Yellow-poplar | -- | 35 | -- | -- | -- | -- | -- | -- | 98 | 99 | 175 | -- | -- | -- | -- |
| Black walnut | -- | 30 | -- | -- | -- | -- | -- | -- | 1,106 | 232 | 91 | -- | -- | -- | -- |
| Black cherry | 214 | 711 | 781 | 880 | 1,225 | 124 | 68 | -- | 2,750 | 1,491 | 3,908 | 1,227 | 425 | 1,375 | 1,300 |
| Butternut | 39 | -- | -- | -- | -- | -- | 25 | -- | 122 | 107 | 26 | -- | -- | -- | -- |
| Elm | 36 | -- | 139 | 876 | 390 | 75 | 278 | -- | 560 | 5,856 | 3,864 | 816 | 393 | 124 | 548 |
| Paper birch | 464 | 808 | 7,164 | 8,098 | 3,251 | 2,959 | 9,226 | 1,631 | 855 | 2,967 | 2,566 | 6,382 | 56,478 | -- | 261 |
| Other hardwoods | 19 | 73 | -- | 1 | 203 | -- | 38 | -- | 1,181 | 3,236 | 985 | 149 | 52 | 775 | -- |
| Noncommercial specie | 26 | 102 | 11 | 134 | 21 | 258 | 162 | -- | 820 | 1,107 | 2,310 | 524 | 773 | 168 | 688 |
| Total | 11,676 | 17,091 | 33,510 | 36,444 | 31,095 | 11,900 | 26,724 | 4,706 | 124,414 | 92,578 | 131,840 | 83,249 | 99,294 | 14,507 | 4,877 |
| All species | 80,509 | 104,521 | 121,150 | 108,626 | 104,963 | 72,405 | 126,378 | 64,923 | 130,556 | 105,374 | 147,440 | 97,380 | 124,625 | 92,967 | 6,889 |
| Number of plots[1] | 346 | 226 | 102 | 336 | 52 | 244 | 651 | 64 | 616 | 563 | 2,928 | 1,529 | 190 | 37 | 89 |

[1] Number of plots by forest type from which average yields were derived.

Table 72.--All live tree biomass on commercial forest land by species group and forest type, Michigan, 1980

(In green tons)

| Species group | All types | Forest type |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 20,468,311 | 566,804 | 1,245,668 | 6,238,347 | 990,056 | 238,250 | 662,120 | 1,274,799 |
| Red pine | 33,041,982 | 2,510,576 | 23,650,975 | 1,026,052 | 167,054 | 68,418 | 280,873 | 70,244 |
| Jack pine | 33,963,901 | 25,114,823 | 3,037,295 | 215,878 | 49,122 | 45,076 | 927,107 | -- |
| White spruce | 14,149,758 | 18,787 | 109,348 | 311,329 | 3,828,580 | 2,010,639 | 194,002 | 1,326,903 |
| Black spruce | 17,514,624 | 529,279 | 102,968 | 264,531 | 1,425,072 | 103,815 | 9,553,498 | 3,581,080 |
| Balsam fir | 51,103,647 | 44,687 | 213,928 | 725,983 | 13,125,533 | 611,607 | 1,651,460 | 8,917,489 |
| Hemlock | 24,730,688 | -- | 68,955 | 105,130 | 481,796 | 7,844 | 111,946 | 745,739 |
| Tamarack | 6,954,471 | 8,083 | 11,059 | 25,916 | 305,818 | 27,181 | 965,050 | 2,317,387 |
| Northern white-cedar | 58,566,961 | 3,319 | 55,447 | 111,826 | 2,555,680 | 438,206 | 1,400,752 | 40,152,115 |
| Other softwoods | 4,544,431 | -- | 177,211 | 356,765 | 3,036 | 146,032 | 2,834 | 91,066 |
| Total | 265,038,774 | 28,796,358 | 28,672,854 | 9,381,757 | 22,931,747 | 3,697,068 | 15,749,642 | 58,476,822 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | 34,207,991 | 170,517 | 507,217 | 241,983 | -- | -- | -- | -- |
| Select red oaks | 65,860,332 | 2,052,724 | 902,388 | 458,867 | 26,720 | -- | -- | -- |
| Other red oaks | 17,196,503 | 779,808 | 727,965 | -- | -- | -- | -- | -- |
| Hickory | 6,446,123 | 16,357 | 28,639 | -- | -- | -- | -- | -- |
| Yellow birch | 32,067,348 | -- | -- | 30,736 | 913,980 | 20,610 | 129,034 | 1,064,956 |
| Hard maple | 170,281,365 | 34,032 | 218,821 | 257,883 | 561,506 | 82,027 | 46,616 | 336,356 |
| Soft maple | 124,063,072 | 456,822 | 741,072 | 723,715 | 2,663,631 | 196,829 | 528,002 | 2,791,939 |
| Beech | 20,513,346 | -- | 26,491 | 48,023 | 13,824 | 14,389 | -- | -- |
| Ash | 41,988,244 | -- | 34,607 | 23,280 | 481,930 | 7,244 | 102,451 | 2,635,326 |
| Balsam poplar | 10,808,208 | -- | 3,690 | 15,489 | 558,276 | 104,662 | 90,339 | 1,250,182 |
| Cottonwood | 3,235,916 | -- | -- | -- | -- | -- | -- | -- |
| Bigtooth aspen | 42,644,753 | 240,833 | 646,207 | 168,764 | 114,165 | 8,158 | 74,959 | 219,519 |
| Quaking aspen | 86,950,725 | 776,862 | 1,163,902 | 744,595 | 3,055,704 | 864,176 | 1,236,931 | 1,551,461 |
| Basswood | 27,394,152 | 23,056 | 26,847 | 7,431 | 15,043 | 3,421 | -- | 83,424 |
| Yellow-poplar | 698,427 | -- | 11,603 | -- | -- | -- | -- | -- |
| Black walnut | 1,423,274 | -- | 9,766 | -- | -- | -- | -- | -- |
| Black cherry | 18,504,249 | 89,320 | 233,203 | 83,624 | 279,527 | 61,317 | 32,176 | 39,879 |
| Butternut | 288,868 | 16,485 | -- | -- | -- | -- | -- | 14,570 |
| Elm | 18,188,254 | 14,966 | -- | 14,869 | 278,377 | 19,530 | 19,582 | 163,193 |
| Paper birch | 42,268,071 | 194,107 | 264,961 | 766,856 | 2,572,795 | 162,724 | 770,213 | 5,413,820 |
| Other hardwoods | 6,560,371 | 8,010 | 23,909 | -- | 461 | 10,179 | -- | 22,341 |
| Noncommercial species | 9,860,846 | 10,859 | 33,577 | 1,206 | 42,685 | 1,047 | 67,180 | 94,855 |
| Total | 781,450,438 | 4,884,758 | 5,604,865 | 3,587,321 | 11,578,624 | 1,556,313 | 3,097,483 | 15,681,821 |
| All species | 1,046,489,212 | 33,681,116 | 34,277,719 | 12,969,078 | 34,510,371 | 5,253,381 | 18,847,125 | 74,158,643 |

(Table 72 continued on next page)

(Table 72 continued)

| Species group | Forest type |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Tamarack | Oak-hickory | Elm-ash-soft maple | Maple-birch | Aspen | Paper birch | Exotic | Non-stocked |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| White pine | 57,392 | 1,327,649 | 631,372 | 4,621,039 | 2,241,148 | 278,665 | 57,385 | 37,617 |
| Red pine | 8,118 | 1,466,671 | 100,688 | 1,020,463 | 2,179,091 | 190,706 | 276,479 | 25,574 |
| Jack pine | 24,027 | 2,294,105 | 13,627 | 673,384 | 1,339,977 | 131,598 | 63,207 | 34,675 |
| White spruce | 2,699 | 65,857 | 485,968 | 2,828,900 | 2,494,486 | 453,627 | 17,682 | 951 |
| Black spruce | 370,831 | 16,446 | 266,979 | 459,960 | 684,670 | 122,375 | -- | 33,120 |
| Balsam fir | 211,941 | 107,725 | 2,552,836 | 10,920,373 | 9,994,960 | 2,012,649 | -- | 12,476 |
| Hemlock | -- | 52,777 | 1,086,339 | 21,232,880 | 629,940 | 206,995 | -- | 347 |
| Tamarack | 2,466,923 | 3,760 | 297,875 | 109,849 | 298,550 | 97,771 | -- | 19,249 |
| Northern white-cedar | 314,547 | 13,237 | 3,027,461 | 5,090,573 | 4,142,259 | 1,252,648 | 2,689 | 6,202 |
| Other softwoods | -- | 98,451 | 22,667 | 611,613 | 63,605 | -- | 2,968,118 | 3,033 |
| Total | 3,456,478 | 5,446,678 | 8,485,812 | 47,569,034 | 24,068,686 | 4,747,034 | 3,385,560 | 173,244 |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Select white oaks | -- | 26,360,894 | 1,435,265 | 3,933,273 | 1,486,334 | 47,930 | 24,578 | -- |
| Select red oaks | -- | 41,514,049 | 708,074 | 12,290,501 | 7,326,008 | 485,426 | 87,664 | 7,911 |
| Other red oaks | -- | 14,118,068 | 204,650 | 861,195 | 479,157 | -- | 25,660 | -- |
| Hickory | -- | 3,863,219 | 188,585 | 2,313,701 | 26,820 | 8,802 | -- | -- |
| Yellow birch | -- | 72,107 | 2,046,344 | 26,936,066 | 647,613 | 199,971 | 5,931 | -- |
| Hard maple | -- | 971,796 | 1,289,447 | 160,258,290 | 4,967,813 | 1,165,616 | 60,365 | 30,797 |
| Soft maple | 48,960 | 7,594,058 | 23,830,726 | 65,824,176 | 16,215,031 | 2,404,362 | 16,524 | 27,225 |
| Beech | -- | 240,878 | 168,496 | 19,439,291 | 469,088 | 91,603 | -- | 1,263 |
| Ash | 17,611 | 1,534,198 | 14,929,497 | 18,395,634 | 3,307,367 | 480,131 | 3,817 | 35,151 |
| Balsam poplar | 36,081 | 22,590 | 730,414 | 743,506 | 6,914,212 | 270,613 | 56,773 | 11,381 |
| Cottonwood | -- | 273,204 | 1,553,423 | 942,320 | 466,969 | -- | -- | -- |
| Bigtooth aspen | -- | 5,132,973 | 356,298 | 7,275,340 | 27,781,141 | 551,806 | 57,125 | 17,465 |
| Quaking aspen | 73,809 | 1,534,782 | 2,802,951 | 15,928,075 | 55,222,380 | 1,780,801 | 166,435 | 47,861 |
| Basswood | -- | 452,735 | 1,142,238 | 24,403,823 | 991,579 | 228,835 | 15,720 | -- |
| Yellow-poplar | -- | 87,092 | 65,748 | 533,984 | -- | -- | -- | -- |
| Black walnut | -- | 980,731 | 154,067 | 278,710 | -- | -- | -- | -- |
| Black cherry | -- | 2,439,030 | 988,944 | 11,916,816 | 2,089,577 | 79,554 | 59,316 | 111,966 |
| Butternut | -- | 108,586 | 70,794 | 78,433 | -- | -- | -- | -- |
| Elm | -- | 496,708 | 3,883,951 | 11,781,002 | 1,389,893 | 73,618 | 5,341 | 47,224 |
| Paper birch | 93,647 | 758,212 | 1,967,536 | 7,825,617 | 10,871,000 | 10,584,111 | -- | 22,472 |
| Other hardwoods | -- | 1,047,225 | 2,146,275 | 3,004,686 | 254,044 | 9,779 | 33,462 | -- |
| Noncommercial species | -- | 727,334 | 734,429 | 7,043,385 | 893,034 | 144,799 | 7,245 | 59,211 |
| Total | 270,108 | 110,330,469 | 61,398,152 | 402,007,824 | 141,799,060 | 18,607,757 | 625,956 | 419,927 |
| All species | 3,726,586 | 115,777,147 | 69,883,964 | 449,576,858 | 165,867,746 | 23,354,791 | 4,011,516 | 593,171 |

Table 73.--All live tree biomass by species group and tree biomass component, Michigan, 1980

| | | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| Species group | All components | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| | | -Green tons- | | | | |
| SOFTWOODS | | | | | | |
| White pine | 20,468,311 | 2,040,428 | 12,189,288 | 5,517,596 | 429,076 | 291,923 |
| Red pine | 33,041,982 | 6,003,291 | 18,273,921 | 8,463,173 | 185,544 | 116,053 |
| Jack pine | 33,963,901 | 6,053,240 | 18,447,271 | 8,324,038 | 691,748 | 447,604 |
| White spruce | 14,149,758 | 2,226,721 | 7,919,098 | 3,747,674 | 156,194 | 100,071 |
| Black spruce | 17,514,624 | 8,013,947 | 6,387,658 | 3,002,748 | 61,356 | 48,915 |
| Balsam fir | 51,103,647 | 21,193,910 | 19,971,004 | 9,250,908 | 393,271 | 294,554 |
| Hemlock | 24,730,688 | 1,754,291 | 14,401,939 | 6,585,497 | 1,218,319 | 770,642 |
| Tamarack | 6,954,471 | 2,557,909 | 2,772,757 | 1,362,239 | 132,205 | 129,361 |
| Northern white-cedar | 58,566,961 | 21,278,584 | 21,530,000 | 10,454,389 | 2,924,482 | 2,379,506 |
| Other softwoods | 4,544,431 | 2,103,424 | 1,449,494 | 648,356 | 214,297 | 128,860 |
| Total | 265,038,774 | 73,225,745 | 123,342,430 | 57,356,618 | 6,406,492 | 4,707,489 |
| HARDWOODS | | | | | | |
| Select white oaks | 34,207,991 | 2,583,066 | 20,270,584 | 9,434,816 | 1,215,413 | 704,112 |
| Select red oaks | 65,860,332 | 2,836,535 | 41,209,572 | 18,693,029 | 1,946,629 | 1,174,567 |
| Other red oaks | 17,196,503 | 771,423 | 10,465,449 | 4,716,395 | 782,621 | 460,615 |
| Hickory | 6,446,123 | 583,336 | 3,852,494 | 1,831,545 | 114,735 | 64,013 |
| Yellow birch | 32,067,348 | 3,087,632 | 15,100,270 | 7,258,876 | 3,749,416 | 2,871,154 |
| Hard maple | 170,281,365 | 30,609,600 | 87,477,220 | 40,693,732 | 7,030,385 | 4,470,428 |
| Soft maple | 124,063,072 | 23,312,870 | 62,142,272 | 29,705,963 | 5,358,206 | 3,543,761 |
| Beech | 20,513,346 | 1,720,044 | 10,288,958 | 4,990,610 | 2,115,726 | 1,398,008 |
| Ash | 41,988,244 | 11,176,241 | 19,857,082 | 9,047,810 | 1,169,084 | 738,027 |
| Balsam poplar | 10,808,208 | 1,493,468 | 5,947,443 | 2,809,185 | 325,097 | 233,015 |
| Cottonwood | 3,235,916 | 168,491 | 2,001,614 | 981,077 | 40,055 | 44,679 |
| Bigtooth aspen | 42,644,753 | 5,267,931 | 23,766,408 | 11,033,490 | 1,525,170 | 1,051,754 |
| Quaking aspen | 86,950,725 | 13,950,017 | 43,874,360 | 20,772,083 | 4,876,787 | 3,477,478 |
| Basswood | 27,394,152 | 1,729,817 | 16,888,735 | 7,432,664 | 826,876 | 516,060 |
| Yellow-poplar | 698,427 | 34,677 | 456,065 | 207,685 | -- | -- |
| Black walnut | 1,423,274 | 42,261 | 905,291 | 421,608 | 35,979 | 18,135 |
| Black cherry | 18,504,249 | 3,337,485 | 8,736,663 | 3,937,813 | 1,576,911 | 915,377 |
| Butternut | 288,868 | 83,219 | 102,681 | 48,257 | 34,490 | 20,221 |
| Elm | 18,188,254 | 4,186,989 | 8,691,081 | 4,084,645 | 781,728 | 443,811 |
| Paper birch | 42,268,071 | 5,612,788 | 22,909,959 | 10,888,803 | 1,752,869 | 1,103,652 |
| Other hardwoods | 6,560,371 | 1,797,298 | 2,604,921 | 1,259,784 | 540,835 | 357,533 |
| Noncommercial species | 9,860,846 | 6,100,943 | -- | -- | 2,458,082 | 1,301,821 |
| Total | 781,450,438 | 120,486,131 | 407,549,122 | 190,249,870 | 38,257,094 | 24,908,221 |
| All species | 1,046,489,212 | 193,711,876 | 530,891,552 | 247,606,488 | 44,663,586 | 29,615,710 |

(Table 73 continued on next page)

Table 73 continued)

| pecies group | All components | Biomass component |  |  |  |  |
|---|---|---|---|---|---|---|
|  |  | 1- to 5-inch trees | Growing stock |  | Cull |  |
|  |  |  | Boles | Tops and limbs | Boles | Tops and limbs |
|  |  | - - - - - - - - - - - - -Thousand cubic feet- | - - - - - - - - - - - - |  |  |  |
| OFTWOODS |  |  |  |  |  |  |
| White pine | 1,131,068 | 112,887 | 673,572 | 304,890 | 23,641 | 16,078 |
| Red pine | 1,610,038 | 291,070 | 891,315 | 412,806 | 9,130 | 5,717 |
| Jack pine | 1,427,846 | 251,957 | 776,430 | 350,438 | 29,733 | 19,288 |
| White spruce | 802,888 | 126,161 | 449,503 | 212,725 | 8,841 | 5,658 |
| Black spruce | 1,071,885 | 489,401 | 391,697 | 184,126 | 3,713 | 2,948 |
| Balsam fir | 2,332,210 | 967,759 | 910,689 | 421,854 | 18,200 | 13,708 |
| Hemlock | 1,044,298 | 73,020 | 607,468 | 277,886 | 52,486 | 33,438 |
| Tamarack | 304,032 | 112,436 | 120,639 | 59,273 | 5,878 | 5,806 |
| Northern white-cedar | 4,002,623 | 1,449,989 | 1,479,501 | 718,407 | 196,208 | 158,518 |
| Other softwoods | 217,390 | 100,379 | 69,386 | 31,050 | 10,346 | 6,229 |
| Total | 13,944,278 | 3,975,059 | 6,370,200 | 2,973,455 | 358,176 | 267,388 |
| ARDWOODS |  |  |  |  |  |  |
| Select white oaks | 1,207,352 | 88,689 | 716,249 | 333,379 | 43,673 | 25,362 |
| Select red oaks | 2,301,853 | 97,392 | 1,439,554 | 653,131 | 69,560 | 42,216 |
| Other red oaks | 594,169 | 26,107 | 361,188 | 162,815 | 27,715 | 16,344 |
| Hickory | 223,930 | 19,741 | 134,129 | 63,766 | 4,036 | 2,258 |
| Yellow birch | 1,205,190 | 114,358 | 564,043 | 271,235 | 144,311 | 111,243 |
| Hard maple | 6,456,637 | 1,151,820 | 3,316,965 | 1,543,052 | 271,480 | 173,320 |
| Soft maple | 5,371,313 | 1,005,950 | 2,689,305 | 1,285,742 | 234,606 | 155,710 |
| Beech | 801,391 | 66,863 | 400,899 | 194,466 | 83,711 | 55,452 |
| Ash | 1,738,454 | 453,626 | 827,394 | 377,093 | 49,025 | 31,316 |
| Balsam poplar | 548,734 | 75,524 | 301,969 | 142,647 | 16,635 | 11,959 |
| Cottonwood | 137,982 | 7,140 | 85,295 | 41,807 | 1,759 | 1,981 |
| Bigtooth aspen | 2,041,960 | 250,260 | 1,138,168 | 528,443 | 73,997 | 51,092 |
| Quaking aspen | 4,151,373 | 662,709 | 2,093,648 | 991,308 | 235,514 | 168,194 |
| Basswood | 1,363,727 | 85,636 | 840,652 | 369,993 | 41,478 | 25,968 |
| Yellow-poplar | 36,947 | 1,833 | 24,127 | 10,987 | -- | -- |
| Black walnut | 53,010 | 1,541 | 33,739 | 15,720 | 1,336 | 674 |
| Black cherry | 838,502 | 149,496 | 395,937 | 178,499 | 72,326 | 42,244 |
| Butternut | 13,082 | 3,728 | 4,660 | 2,191 | 1,577 | 926 |
| Elm | 714,324 | 162,761 | 341,942 | 160,732 | 31,100 | 17,789 |
| Paper birch | 1,758,968 | 233,624 | 952,433 | 452,713 | 73,686 | 46,512 |
| Other hardwoods | 275,322 | 74,810 | 109,190 | 52,829 | 23,139 | 15,354 |
| Noncommercial species | 414,445 | 253,942 | -- | -- | 104,892 | 55,611 |
| Total | 32,248,665 | 4,987,550 | 16,771,486 | 7,832,548 | 1,605,556 | 1,051,525 |
| ll species | 46,192,943 | 8,962,609 | 23,141,686 | 10,806,003 | 1,963,732 | 1,318,913 |

Table 74.--Sampling errors[1] for estimates smaller than the Unit totals of volume, net growth, removals, and area of commercial forest land, Michigan, 1980

| ampling error | Commercial forest area | Growing stock |  |  | Sawtimber |  |  |
|---|---|---|---|---|---|---|---|
|  |  | Inventory | Growth | Removals | Inventory | Growth | Removals |
| Percent | Thousand acres | - - - -Million cubic feet- - - - |  |  | - - - -Million board feet[2] - - - |  |  |
| 1 | 1,898.8 | 9,415.2 | 731.7 | 14,102.5 | 55,754.1 | 7,199.6 | 63,265.7 |
| 2 | 474.7 | 2,353.8 | 182.9 | 3,525.6 | 13,938.5 | 1,799.9 | 15,816.4 |
| 3 | 211.0 | 1,046.1 | 81.3 | 1,566.9 | 6,194.9 | 800.0 | 7,029.5 |
| 4 | 118.7 | 588.5 | 45.7 | 881.4 | 3,484.6 | 450.0 | 3,954.1 |
| 5 | 76.0 | 376.6 | 29.3 | 564.1 | 2,230.2 | 288.0 | 2,530.6 |
| 10 | 19.0 | 94.2 | 7.3 | 141.0 | 557.5 | 72.0 | 632.7 |
| 15 | 8.4 | 41.8 | 3.3 | 62.7 | 247.8 | 32.0 | 281.2 |
| 20 | 4.7 | 23.5 | 1.8 | 35.3 | 139.4 | 18.0 | 158.2 |
| 25 | 3.0 | 15.1 | 1.2 | 22.6 | 89.2 | 11.5 | 101.2 |
| 50 | 0.8 | 3.8 | 0.3 | 5.6 | 22.3 | 2.9 | 25.3 |
| 100 | 0.2 | 0.9 | 0.1 | 1.4 | 5.6 | 0.7 | 6.3 |

[1] At the 68-percent probability level.

[2] International 1/4-inch rule.

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The fourth inventory of the timber resource of Michigan shows a 7 percent decline in commercial forest area and a 27 percent gain in growing-stock volume between 1966 and 1980. Highlights and statistics are presented on area, volume, growth, mortality, removals, utilization, and biomass.

KEY WORDS: Timber resource, area, volume, growth, mortality, removals

**United States Department of Agriculture**

Forest Service

North Central Forest Experiment Station

Resource Bulletin **NC-68**

# Michigan's Fourth Forest Inventory: AREA

John S. Spencer, Jr.

North Central Forest Experiment Station
Forest Service—U. S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
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Information contained in this report includes the most commonly used Forest Inventory and Analysis statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complete retrieval involving the services of a Forest Inventory and Analysis computer programmer. If requests for data conflict with ongoing work, they will be scheduled so as to minimize the impact on the work unit.

Requests for unpublished information may be directed to:

Burton L. Essex
Forest Inventory and Analysis Project
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108

Phone: (612) 642-5282

Area served: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, Wisconsin.

# FOREWORD

Forest Inventory and Analysis (formerly called Resources Evaluation) is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Forest Inventory and Analysis work done in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1980 Michigan forest inventory was begun in October 1977 and was completed in May 1981. Reports on the three previous surveys of Michigan's timber resource are dated 1935, 1955, and 1966.

Resource Bulletins reporting statistical highlights and detailed tables of the four Survey Units in Michigan are available.

More accurate survey information was obtained during the 1980 survey than otherwise would have been feasible because of intensified field sampling. Such sampling was made possible by additional funding and personnel provided the North Central Station by the Michigan Department of Natural Resources and by interested forest industries. Data from the Department's canvass of all primary wood-using plants in the State were used to help estimate the quantity of timber products harvested in Michigan.

Aerial photos used in the Michigan Forest Inventory were furnished by the Michigan Department of Natural Resources and the National Forests.

# CONTENTS

*Page*

Highlights .......... 1
Forest Land Use and Ownership .......... 1
  Commercial Forest Area Falls 7.3 Percent .......... 1
  Timber Harvest Most Extensive Treatment Between Surveys .......... 2
  Area of Noncommercial Forest Increases .......... 3
  Nonforest Land With Trees—An Additional Resource 3
  Upper Peninsula Most Heavily Timbered .......... 4
  Nonindustrial Private Owners Account for 53 Percent of Commercial Forest .......... 4
  State Owns 20 Percent of Commercial Forest .......... 4
Characteristics of Commerical Forest Land .......... 5
  Maple-Birch and Aspen Types Account for More Than Half of Commercial Area .......... 5
  Poletimber Stands Predominate .......... 6
  Largest Area in Stands From 41-60 Years Old .......... 6
  Fifty Eight Percent of Commercial Forest on Deep, Well-Drained Soils .......... 7
  Average Site Index is 61 Feet .......... 8
  Site Class—Another Way of Looking at Site Quality .. 8
  Plantations Make Up 7 Percent of Commercial Forest 8
  Stocking of Growing-Stock Trees is Good .......... 9
  Almost Two-Fifths of Forest Within ¼ Mile of Road ... 9
  One-Third of Forest Within 1 Mile of Open Water ..... 9
Appendix .......... 11
  Accuracy of Survey .......... 11
  Survey Procedures .......... 11
  Comparing Michigan's Fourth Inventory with the Third Inventory .......... 11
  Identifying and Correcting Definitional or Procedural Changes .......... 11
  Tree Species Groups in Michigan .......... 12
  Metric Equivalents of Units Used in this Report ...... 13
  Definition of Terms .......... 13
  Tables .......... 16

# MICHIGAN'S FOURTH FOREST INVENTORY: AREA

**John S. Spencer, Jr.,** *Principal Resource Analyst*

## HIGHLIGHTS

- Forest land declined from 19.4 to 18.4 million acres between 1966 and 1980.
- Commercial forest land dropped from 18.9 to 17.5 million acres during the same 14-year period, a 7 percent loss.
- Greatest proportional loss of commercial forest was in the Southern Lower Peninsula—12 percent.
- Noncommercial forest area increased from 516 to 879 thousand acres between surveys, mostly from a doubling of productive-reserved forest area.
- Eighty-two percent of the land area in the Western Upper Peninsula is commercial forest land—highest proportion in the State.
- Nonindustrial private parties own 53 percent of the total commercial forest area.
- One-fourth of the commercial forest owned by nonindustrial private parties is in tracts from 101 to 500 acres in size.
- Thirty-eight percent of the nonindustrial private forest land has been owned by the same party for at least 20 years.
- The maple-birch forest type increased from 5.2 million acres in 1966 (28 percent of the total commercial area) to 6.1 million acres in 1980 (35 percent of the total commercial area).
- Poletimber stands account for the largest area by stand-size class—7.8 million acres or 44 percent of the total.
- The largest commercial area is in stands from 41 to 60 years old.
- Forest plantations total 1.2 million acres in 1980, 7 percent of the total commercial forest area.
- Fifty-eight percent of commercial forest is on deep, well-drained soils .
- Average site index is 61.2 feet, compared to a Lake States average of 59.1 feet.
- Timber was harvested on 2.4 million acres between 1966 and 1980.
- Eighty-seven percent of the commercial forest is medium-stocked or better.
- Thirty-nine percent of the commercial forest land is within ¼ mile of a maintained road.

* * * *

From the deep northern hardwood stands of the Upper Peninsula to the scattered oak-hickory woodlots of the southern Lower Peninsula, forest land declined from 19.4 to 18.4 million acres between 1966 and 1980. This 5.2 percent drop averages out to a loss of 72 thousand acres per year.

## FOREST LAND USE AND OWNERSHIP

### Commercial Forest Area Falls 7.3 Percent

Commercial forest land, which accounts for 95 percent of the total forest land, dropped from 18.9[1] to 17.5 million acres between 1966 and 1980. The average yearly loss was 98 thousand acres during the 14 years between surveys. The annual rate of change, then, was (-) 0.5 percent compared to (-) 0.7 percent in Minnesota and (-) 0.2 percent in Wisconsin from the most recent inventories of the latter two States.

The loss of commercial forest land varied widely by Survey Unit (fig. 1). The Southern Lower Peninsula Unit showed the greatest proportional decline between surveys (12.4 percent), and the Northern Lower Peninsula Unit revealed the smallest decline (3.7 percent) (table 1).

The remeasurement of plots established during the 1966 inventory permitted a rough idea of the

---

[1] *1966 area figures have been adjusted slightly from those published after the 1966 survey to conform to 1980 areas due to changes in survey procedures and definitions.*

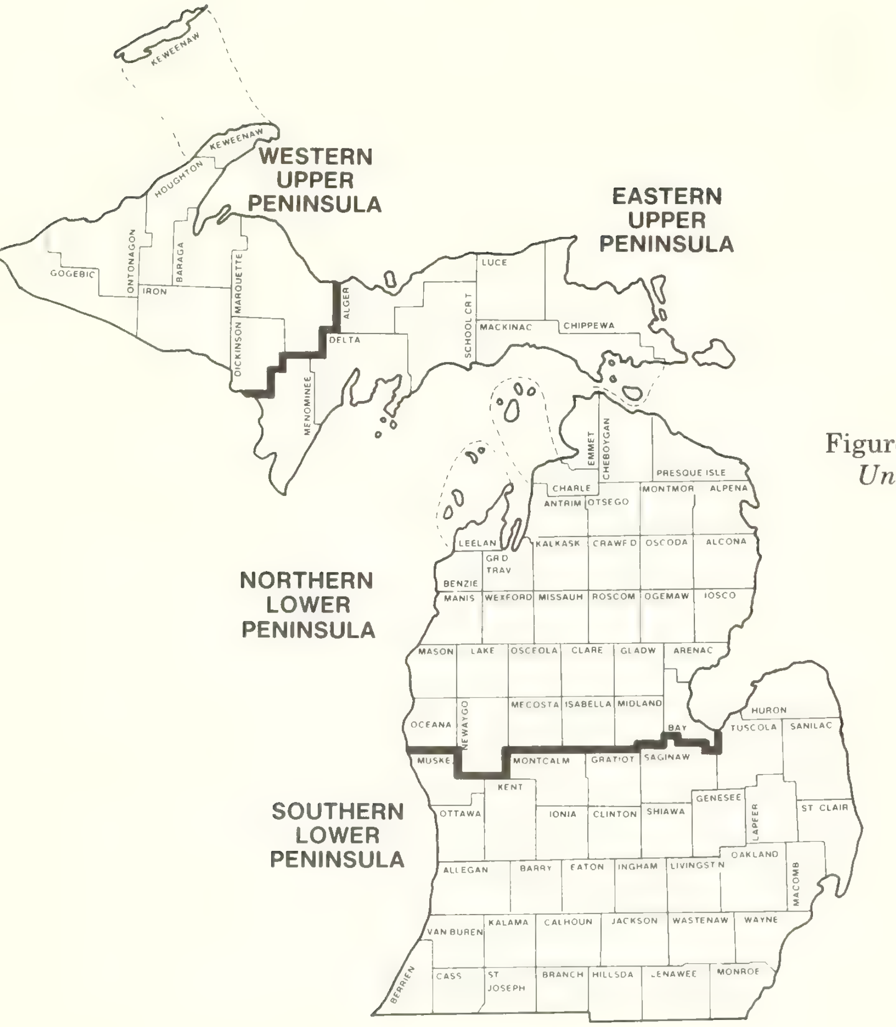

Figure 1.—*Michigan Forest Survey Units, 1980.*

Table 1.—*Area of commercial forest land, Michigan, 1966 and 1980, and percent change between surveys*

| **Survey Unit** | **Area of commercial forest**<br>**1966** | <br>**1980** | <br>**Percent change** |
|---|---|---|---|
| | (Thousand acres) | | |
| Western Upper Peninsula | 4,920.9 | 4,529.6 | (-) 8.0 |
| Eastern Upper Peninsula | 4,169.1 | 3,801.6 | (-) 8.8 |
| Northern Lower Peninsula | 6,955.1 | 6,694.9 | (-) 3.7 |
| Southern Lower Peninsula | 2,812.2 | 2,463.4 | (-) 12.4 |
| State Total | 18,857.3 | 17,489.5 | (-) 7.3 |

uses made of some of the commercial forest lost between surveys. Because plots were not remeasured on all the National Forests or on State land, the results cannot be applied to that land. Analysis of the plots showed that 95 percent of them remained commercial forest land in 1980. Of the plots that changed land use, half were converted to the urban and related classification as shown in the following tabulation:

| **Land use class** | **Percent of remeasured commercial forest plots by land use class in 1980**[2] |
|---|---|
| Commercial forest | 95.4 |
| Urban and related | 2.4 |
| Water and marsh | 0.9 |
| Cropland | 0.5 |
| Productive-reserved forest | 0.4 |
| Unproductive forest | 0.2 |
| Pasture and range | 0.2 |
| Total | 100.0 |

# Timber Harvest Most Extensive Treatment Between Surveys

As field crews remeasure field plots, they gather information concerning man-caused disturbance or improvement to the timber stand since the past survey. They also record any damage (natural or man-caused) to the stand. The estimate of stand history resulting from this information is useful in gauging the intensity of management or level of damage in the State's commercial forest.

---

[2] *Excludes National Forest and State commercial forest land.*

Between 1966 and 1980, 79 percent of the commercial forest (13.8 million acres) was undisturbed by man and suffered no major damage (table 2). The changes that did occur to this area were the result of natural processes.

Timber harvest affected 2.4 million acres between surveys, 14 percent of the commercial forest and more than any other treatment class. Partial cutting was observed on 79 percent of the harvested area, and clearcutting accounted for the remaining 21 percent. Even though forest industry land makes up only 11 percent of the commercial forest, harvesting on it accounted for 22 percent of the acres harvested by all owners.

Timber stand improvement was the next most extensive treatment, having been performed on 0.7 million acres, 4 percent of the total commercial area. Ninety percent of this work (mostly thinnings) was done on public land, although another 9 percent of it was performed on nonindustrial privately owned forest land.

Tree planting was the treatment on 0.4 million acres, 3 percent of the total area. About one-fifth of the tree planting was done on formerly nonforest land. Nonindustrial private land accounted for 53 percent of the acres planted and public land accounted for 45 percent of it.

Significant damage was observed on 0.2 million acres. Most of it (86 percent) was due to natural causes such as disease, wind, fire, or insects. The remainder was man-caused, primarily flooding and draining.

## Area of Noncommercial Forest Increases

Noncommercial forest land jumped from 516 to 879 thousand acres between 1966 and 1980, a gain of 70 percent. Most of this increase was due to the doubling of productive-reserved forest land, from 311 to 622 thousand acres. The new productive-reserved areas consist of scattered tracts throughout the State and include State recreation areas, State parks, State sharptail grouse management areas, the Sleeping Bear National Lakeshore, the Sturgeon River and Sylvania RARE II areas, the McCormick and Sylvania tracts on the Ottawa National Forest, and others. Most of these areas were classed as commercial forest before they were designated as places where timber harvesting would be precluded and, therefore, they represent part of the reason for the decline in commercial forest between surveys.

Unproductive forest land, that incapable of growing crops of industrial wood because of adverse site conditions, also increased between surveys—from 205 to 257 thousand acres.

## Nonforest Land With Trees—An Additional Resource

Besides commercial and noncommercial forest land, some nonforest land grows trees, too—in some cases

Table 2.—*Area of commercial forest land by treatment or damage class and owner group, Michigan, 1966-1980*

(In thousand acres)

| Treatment or damage class 1966-1980 | Owner group | | | | |
|---|---|---|---|---|---|
| | All owners | Public | Forest industry | Farmer | Miscellaneous private |
| No disturbance | 13,782.6 | 4,575.2 | 1,424.7 | 2,599.1 | 5,183.6 |
| Timber stand improvement | 656.3 | 590.9 | 7.6 | 29.3 | 28.5 |
| Harvest (clearcut) | 487.5 | 291.5 | 50.6 | 39.9 | 105.5 |
| Harvest (partial cut) | 1,870.2 | 512.6 | 472.9 | 325.1 | 559.6 |
| Damage (natural) | 198.7 | 86.3 | 11.6 | 22.5 | 78.3 |
| Damage (man-caused) | 33.0 | 11.4 | 2.3 | 3.8 | 15.5 |
| Artificial regeneration: | | | | | |
| Forest land | 340.8 | 177.1 | 7.9 | 43.1 | 112.7 |
| Nonforest land | 96.1 | 19.2 | 1.6 | 24.2 | 51.1 |
| Natural regeneration: | | | | | |
| Nonforest land | 24.3 | 2.5 | 1.5 | 4.4 | 15.9 |
| All treatments | 17,489.5 | 6,266.7 | 1,980.7 | 3,091.4 | 6,150.7 |

in substantial numbers. To be classed as nonforest land with trees, an area must contain at least one tree per acre that is at least 5 inches in diameter at breast height (d.b.h.). Such areas amount to 719 thousand acres in Michigan.

As shown in the following tabulation, wooded strips are the largest portion of this area with 241 thousand acres. They meet the definition for commercial forest except that they are in parcels less than 120 feet wide. In general, nonforest land with trees offers some opportunities for management and harvest, particularly for fuelwood. However, the small areas involved and the scattered frequency of the trees impose economic constraints on the harvest of other timber products.

| **Land use** | **Area of nonforest land with trees** (Thousand acres) |
|---|---|
| Wooded strips | 241.3 |
| Marsh | 235.3 |
| Cropland | 96.8 |
| Improved pasture | 82.2 |
| Windbreaks | 37.5 |
| Wooded pasture | 13.4 |
| Idle farmland | 12.8 |
| Total | 719.3 |

## Upper Peninsula Most Heavily Timbered

Commercial forests grow on 79 percent of the land area in the Upper Peninsula compared to 35 percent in the Lower Peninsula. The Western Upper Peninsula is the most heavily forested Survey Unit with 82 percent of its land area in commercial forest, and it contains the three most heavily forested counties in the State: Baraga (89 percent), Gogebic (88), and Iron (87). Every county in the Western Upper Peninsula maintains commercial forest cover on at least three-fourths of its land area except Keweenaw County, which has a large area of productive-reserved forest in Isle Royal National Park. Least heavily forested counties are generally found in the Southern Lower Peninsula, although Bay County in the Northern Lower Peninsula has the lowest proportion of commercial forest land in the State (6 percent) (fig. 2).

## Nonindustrial Private Owners Account for 53 percent of Commercial Forest

Private parties (other than farmers) own the largest share of the State's commercial forest, 6.1 million acres or 35 percent of the total. When combined with the 3.1 million acres owned by farmers (18 percent of the total), the resulting 9.2 million acres of nonindustrial private-owned commercial forest represents over half of Michigan's total (fig. 3). Nonindustrial private owners are a diverse group representing many persons with contrasting backgrounds, goals and strategies of management.

Nonindustrial private parties own more area in the Lower Peninsula (67 percent) than in the Upper Peninsula (37 percent). For example, farmers only own 4 percent of the commercial forest in the Western Upper Peninsula but they own 47 percent of it in the Southern Lower Peninsula.

One-fifth of the nonindustrial private forest land is owned by parties with more than 500 acres of commercial forest land. Another one-fourth is owned by parties with from 101 to 500 acres as shown in the following tabulation. These areas represent the total area owned by an individual, and may include one or more non-contiguous tracts.

| **Size of holding** (Acres) | **Area owned by nonindustrial private parties** (Thousand acres) |
|---|---|
| 1-4 | 180.0 |
| 5-10 | 432.8 |
| 11-20 | 684.6 |
| 21-50 | 2,017.1 |
| 51-100 | 1,746.5 |
| 101-500 | 2,418.4 |
| 501-2,500 | 709.2 |
| 2,501-5,000 | 68.4 |
| 5,001 + | 985.0 |
| Total | 9,242.0 |

Thirty-eight percent of the nonindustrial private forest land has been owned by the same party for 20 years or more:

| **Owner tenure** (Years) | **Area owned by nonindustrial private parties** (Thousand acres) |
|---|---|
| 1-4 | 1,837.6 |
| 5-9 | 1,755.6 |
| 10-19 | 2,146.3 |
| 20 + | 3,502.5 |
| Total | 9,242.0 |

## State Owns 20 Percent of Commercial Forest

The State of Michigan owns 3.6 million acres of commercial forest, half of which is in the Northern Lower Peninsula. National Forests account for 2.4 million acres (14 percent of the total), approximately evenly divided among the three northernmost Survey Units. Forest industry holds 2.0 million acres

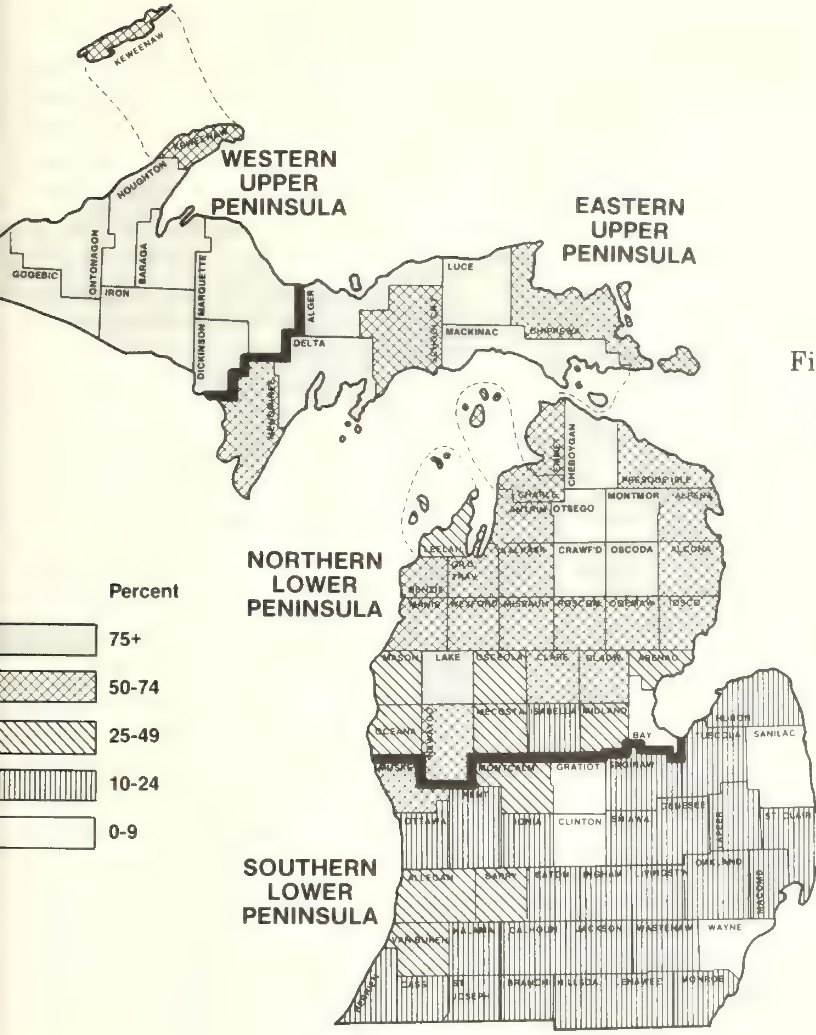

Figure 2.—*Commercial forest area as a percent of all land area, Michigan, 1980.*

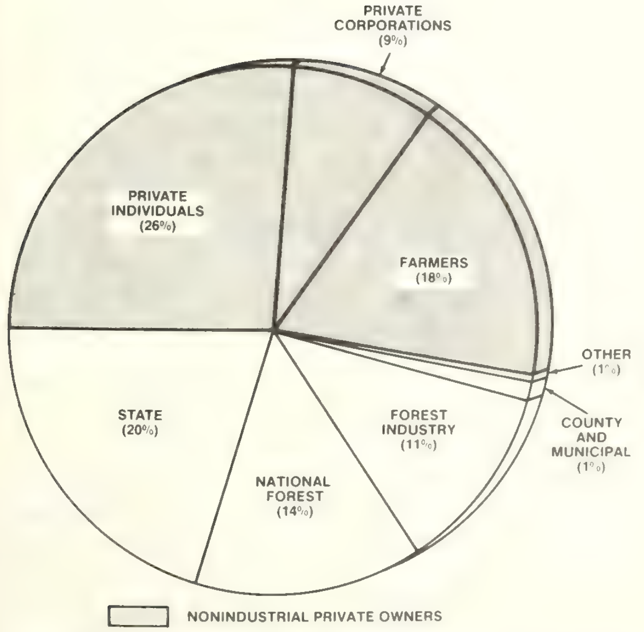

Figure 3.—*Area of commercial forest land by ownership class, Michigan, 1980.*

(11 percent of the total), two-thirds in the Western Upper Peninsula alone and only 76,000 acres in the Lower Peninsula. Practically all (98 percent) of the forest industry land is owned by companies with holdings of more than 5,000 acres. Fifty-three percent of forest industry forest land has been held by the same owner for at least 20 years. Another 22 percent has been held for at least 10 years.

The remaining 0.3 million acres of commercial forest are owned by county and municipal governments (1 percent of the State total), and by miscellaneous federal agencies and Indian tribes (both less than 1 percent).

# CHARACTERISTICS OF COMMERCIAL FOREST LAND

## Maple-Birch and Aspen Types Account for More Than Half of Commercial Area

Maple-birch stands dominate Michigan's forests now even more than they did in 1966. The 6.1 million acres in the maple-birch forest type in 1980 represents 35 percent of the commercial forest, compared to the 5.2 million acres in 1966 which comprised 28 percent of the total. The maple-birch type is most extensive in the Western Upper Peninsula where it amounts to half of the Unit's commercial area.

The next largest forest type is aspen with 3.4 million acres or 19 percent of the total commercial area. Unlike the maple-birch type, the aspen type declined in area between inventories—from 4.2 million acres in 1966. Some of the gain of the maple-birch type from 1966 to 1980 undoubtedly came at the expense of the aspen type as mature aspen stands gave way to their more tolerant understories, some of which were made up of species associated with the maple-birch type. (Data from the inventory do not completely explain the movement of area between forest types since the last inventory.) The aspen type is most widespread in the Northern Lower Peninsula where it comprises 27 percent of the area.

Almost twice as many forest types lost area between surveys as did types that gained area, as seen in the following tabulation:

| **Forest type** | **Commercial forest area** 1966 | 1980 |
|---|---|---|
| | (Thousand acres) | |
| Jack pine | 883.5 | 836.7 |
| Red pine | 594.8 | 655.9 |
| White pine | 147.9 | 214.1 |
| Spruce-fir | 1,071.9 | 735.5 |
| Black spruce | 421.1 | 520.6 |
| No. white-cedar | 1,166.0 | 1,173.6 |
| Tamarack | 168.9 | 114.8 |
| Oak-hickory | 2,360.9 | 1,773.6 |
| Elm-ash-soft maple | 1,897.1 | 1,326.4 |
| Maple-birch | 5,215.8 | 6,098.4 |
| Aspen | 4,150.4 | 3,406.6 |
| Paper birch | 416.5 | 374.8 |
| Exotic[3] | 86.2 | 86.3 |
| Nonstocked | 276.3 | 172.2 |
| All types | 18,857.3 | 17,489.5 |

The largest area increase was the 883 thousand acres gained by the maple-birch type, but the greatest proportional increase was the 45 percent jump made by the white pine type. The largest area loss was the 744 thousand acre decline registered by the aspen type. However, the 38 percent contraction in nonstocked area between surveys was the highest proportional loss. Other large losses were taken by the tamarack type (32 percent or 54 thousand acres), the elm-ash-soft maple type (30 percent or 571 thousand acres), and the oak-hickory type (25 percent or 587 thousand acres).

## Poletimber Stands Predominate

As in the other two Lake States[4], poletimber stands in Michigan account for the largest area by stand-size class—7.8 million acres or 44 percent of the total. This compares to a National average for the proportion of poletimber stands of 28 percent. The Lake States is the only region of the country where sawtimber stands do not predominate. This reflects the continuing rebuilding and maturation of stands from the cutover and burned over conditions in the late nineteenth and early twentieth centuries.

Sawtimber stands make up 29 percent of the State's commercial forest area, more than the other Lake States, but substantially lower than the National average of 45 percent. In 1966 sawtimber stands represented 25 percent of the State total.

| **Stand-size class** | **1980 area** (Thousand acres) |
|---|---|
| Sawtimber | 5,146.0 |
| Poletimber | 7,753.4 |
| Sapling and seedling | 4,417.9 |
| Nonstocked | 172.2 |
| All stands | 17,489.5 |

The largest area of sawtimber stands is in the maple-birch type (2.5 million acres), but the highest proportion within any forest type is the 69 percent in the white pine type.

## Largest Area in Stands From 41 to 60 Years Old

Half of the stands in the State are 50 years of age or younger. Areas by 10-year age classes are somewhat uneven, with largest areas in the 41-60 year classes (fig. 4). These stands, originating between 1920 and 1939, got their start as a result of the then newly implemented fire control and tree planting programs that did so much to turn the forest situation around in Michigan.

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[3] *The exotic forest type includes species not native to Michigan, mostly Scotch pine.*

[4] *The Lake States Region includes Michigan, Wisconsin, and Minnesota in this report.*

The distribution of area by stand age for individual forest types reveals much about the history and vitality of those stands. The maple-birch type, consisting of generally long-lived species, includes 1.4 million acres (23 percent of the total type area) in stands older than 90 years. Ninety is the rotation age[5] suggested by the Michigan Department of Natural Resources for the maple-birch type on average sites. Unmanaged maple-birch stands more than 90 years of age, then, can be expected to decline in growth and vigor. Many maple-birch stands came into being because of the shade-tolerance and longevity of species associated with the type. These species formed part of the understory of other forest types and simply outlived the overstory as well as other understory species.

Aspen is a short-lived species. Aspen stands usually begin to deteriorate at about age 40 to 60 years and then are replaced by a new stand, not always aspen. Therefore, aspen stands more than 60 years old are prime candidates for conversion to other types, especially those with understories that are not aspen. In Michigan 617 thousand acres of the aspen type (18 percent of the type area) are older than 60 years of age.

One third of the aspen type (1.1 million acres) supports a natural coniferous understory, and another 42 thousand acres of aspen supports an understory of planted conifers. If these stands are not managed to favor aspen, some of them will convert to a conifer type. Clearcutting aspen tends to bring about pure aspen stands on the same site. As more aspen stands are harvested, the decline of area in the aspen type noticed between 1966 and 1980 may slow and reverse. The large areas in stands aged between 1 and 20 years (1.3 million acres) suggest that this process may have begun.

Substantial areas of softwood types are in older age classes and, therefore, are most susceptible to the ravages of forest pests such as the spruce budworm, which is currently causing significant mortality in the State.

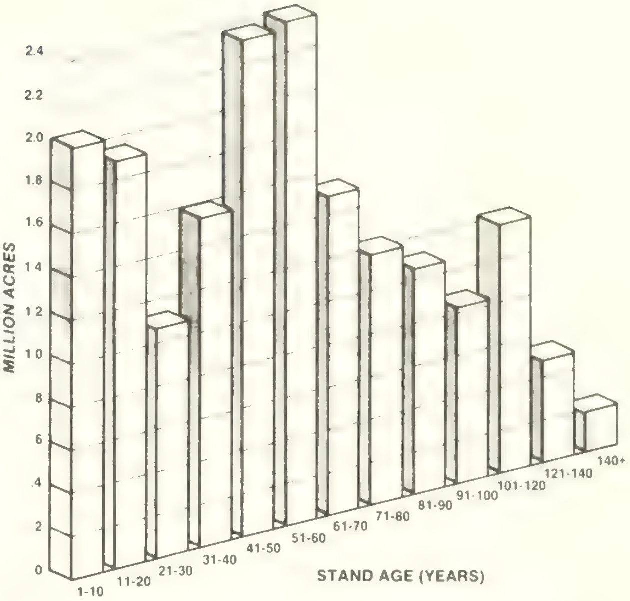

Figure 4.—*Area of commercial forest land by stand-age class, Michigan, 1980.*

## Fifty-Eight Percent of Commercial Forest on Deep, Well-Drained Soils

Physiographic class is a measure of soil and water conditions on a site that affect tree growth. The five classes are a continuum, ranging from exceptionally wet sites (hydric) to very dry sites (xeric). The midpoint of the classes contains sites where conditions are most favorable for growth for most species (mesic). Fifty-eight percent of Michigan's commercial forest land occupies mesic sites, including 89 percent of the maple-birch type and 69 percent of the oak-hickory and white pine types. Forest types that generally prefer drier sites in Michigan include jack pine, red pine, oak-hickory, and exotic (table 3).

## Average Site Index is 61 Feet

Site index provides another perspective of forest site quality by classing forest land in terms of the height growth made by dominant or codominant trees of selected species at 50 years of age. Seventy-five percent of the State's commercial forest (13.1 million acres) grows trees taller than 51 feet at age 50, and 11 percent of the total area grows trees taller than 81 feet (fig. 5).

Site index values fluctuate by forest type. A site index in the high range for one type may be considered average for another type. And if a forest type is converted to another type, the new site index for that site may bear little resemblance to the old one.

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[5] *Rotation is the planned number of years between regeneration of a stand and its final cutting for a specific product.*

Table 3—*Area of commercial forest land by forest type and physiographic class, Michigan, 1980*

(In thousand acres)

| Forest type | All classes | Physiographic class | | | | |
|---|---|---|---|---|---|---|
| | | Hydric | Hydromesic | Mesic | Xeromesic | Xeric |
| Jack pine | 836.7 | 4.1 | 63.3 | 87.8 | 610.6 | 70.9 |
| Red pine | 655.9 | 1.7 | 8.2 | 224.6 | 421.4 | — |
| White pine | 214.1 | 5.4 | 34.0 | 147.9 | 26.8 | — |
| Balsam fir | 635.4 | 39.5 | 357.8 | 219.8 | 18.3 | — |
| White spruce | 100.1 | 1.4 | 29.3 | 63.5 | 5.9 | — |
| Black spruce | 520.6 | 144.3 | 291.2 | 37.9 | 47.2 | — |
| Northern white-cedar | 1,173.6 | 151.8 | 948.3 | 73.5 | — | — |
| Tamarack | 114.8 | 47.6 | 67.2 | — | — | — |
| Oak-hickory | 1,773.6 | — | 123.2 | 1,222.2 | 414.4 | 13.8 |
| Elm-ash-soft maple | 1,326.4 | 127.4 | 1,152.1 | 46.9 | — | — |
| Maple-birch | 6,098.4 | 15.5 | 514.5 | 5,405.0 | 159.2 | 4.2 |
| Aspen | 3,406.6 | 43.6 | 870.3 | 2,206.7 | 277.3 | 8.7 |
| Paper birch | 374.8 | 8.3 | 133.0 | 225.8 | 7.7 | — |
| Exotic | 86.3 | — | 3.9 | 52.9 | 29.5 | — |
| Nonstocked | 172.2 | 20.6 | 30.1 | 76.4 | 37.8 | 7.3 |
| All types | 17,489.5 | 611.2 | 4,626.4 | 10,090.9 | 2,056.1 | 104.9 |

The weighted average site index for all types in Michigan is 61.2 feet, compared to the Lake States average[6] of 59.1 feet. The highest weighted average of any forest type in the State is the 69.0 feet for the aspen type, followed by maple-birch (66.0 feet), elm-ash-soft maple (64.0 feet), and oak-hickory (62.4 feet). The lowest average is the 32.6 feet of the northern white-cedar type.

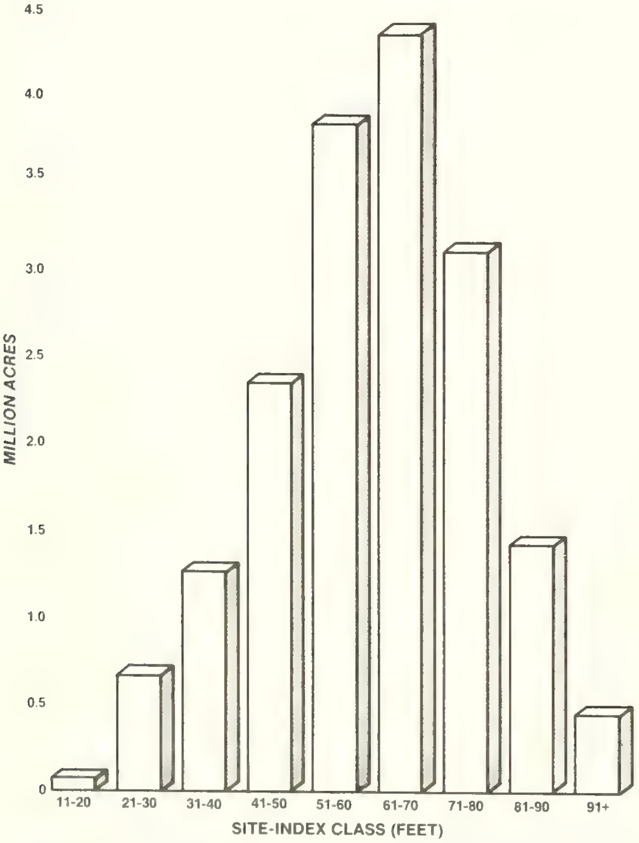

Figure 5.—*Area of commercial forest land by site-index class, Michigan, 1980.*

## Site Class—Another Way of Looking at Site Quality

A third mechanism by which the quality of a forest site can be judged is site class. Site class is a means of describing forest land in terms of its inherent capacity to grow wood based on the culmination of mean annual increment[7] for fully stocked natural stands. Site class values are the cubic feet of growth per acre per year that might be expected from such stands.

The weighted average site class for Michigan is 63.6 cubic feet of growth per acre per year, compared to the Lake States average of 58.9. The highest average among types in the State is the 92.7 cubic feet per acre per year of the balsam fir type, followed by the red pine type (83.9 cubic feet), exotic (79.3 cubic feet), aspen (77.2 cubic feet), white pine (74.1 cubic feet), and white spruce (70.6 cubic feet).

## Plantations Make Up 7 Percent of Commercial Forest

Forest plantations totaled 1.2 million acres in 1980. Seventy-seven percent of the plantation area is in the Lower Peninsula:

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[6] *Based on 1968 data for Wisconsin and 1977 data for Minnesota.*

[7] *Culmination of mean annual increment is the point at which a curve plotting current annual increment crosses a curve plotting mean annual increment.*

| Survey unit | Area of plantations (Thousand acres) | Percent of total |
|---|---|---|
| Eastern Upper Peninsula | 168.6 | 14 |
| Western Upper Peninsula | 110.4 | 9 |
| Northern Lower Peninsula | 742.4 | 61 |
| Southern Lower Peninsula | 191.4 | 16 |
| All Units | 1,212.8 | 100 |

Forest plantations were classed into forest types in the same way that other forest land was typed. Therefore, a field plot that fell in a red pine plantation beneath an overstory of species associated with the maple-birch type would be typed maple-birch if the stocking and size of the overstory trees were sufficient to meet the requirements for the type. Likewise, a plot that fell in a red pine plantation with competing trees of species associated with the oak-hickory type would be typed oak-hickory if the stocking and size of the competing trees were sufficient to warrant it. The type assigned to a plantation, then, does not always correspond to the species planted.

Plantations in the red pine type are the most extensive with 508 thousand acres, 42 percent of the total plantation area. Jack pine is the second largest plantation type with 225 thousand acres (19 percent of the total), followed by maple-birch with 127 thousand acres (11 percent), exotic with 96 thousand acres (8 percent), and oak-hickory with 95 thousand acres (8 percent).

A look at the species composition of plantations by forest type is helpful in estimating the species planted. Table 26 in the Appendix shows the total number of growing-stock trees by species group and forest type in plantations, but the following tabulation suggests the primary species that were probably planted in plantations of each forest type:

| Forest type | Species planted |
|---|---|
| Jack pine | Jack pine, red pine |
| Red pine | Red pine, jack pine |
| White pine | White pine |
| Balsam fir | Balsam fir |
| White spruce | White spruce |
| Black spruce | Black spruce |
| Oak-hickory | Red pine, jack pine |
| Elm-ash-cottonwood | Red pine |
| Maple-birch | Red pine, white pine |
| Aspen | Red pine, jack pine |
| Paper birch | White spruce |
| Exotic | Scotch pine, Austrian pine |

Forty-three percent of the plantations are from 11 to 30 years of age, having been planted between 1950 and 1969. Seventy-five percent of the area of plantations is on sites with site indices ranging from 41 to 70 feet.

## Stocking of Growing-Stock Trees is Good

Eighty-seven percent of the commercial forest (15.3 million acres) is at least 61 percent stocked with growing-stock trees (medium stocking or better). Of this area, 10 percent (1.5 million acres) is overstocked with trees (134 percent stocked or more).

Although these figures indicate that the stocking level of forests in the State is not a major problem, the stocking of sapling and seedling stands is more sparse than in other stand-size classes. Twenty percent of sapling-seedling stands are poorly stocked (16.7 to 60.9 percent stocked), compared to 10 percent of poletimber stands and 8 percent of sawtimber stands.

## Almost Two-Fifths of Forest Within ¼ Mile of Road

The proximity of stands to maintained roads is an indicator of potential use by man—whether for timber harvesting, recreation, or other use. In Michigan, 39 percent of the commercial forest is within one-fourth mile of a maintained road (one that is graded at least once a year), and 85 percent of it is within 1 mile of a road:

| Distance to road (Miles) | Area of commercial forest land (Thousand acres) | Percent |
|---|---|---|
| 0–⅛ | 3,663.4 | 21 |
| ⅛–¼ | 3,138.0 | 18 |
| ¼–1 | 8,018.3 | 46 |
| 1–2½ | 2,121.2 | 12 |
| 2½–5 | 368.2 | 2 |
| 5–10 | 11.9 | ([8]) |
| 10–20 | 159.0 | 1 |
| 20+ | 9.5 | ([8]) |
| Total | 17,489.5 | 100 |

## One-Third of Forest Within 1 Mile of Open Water

The nearness of a forest stand to a body of open water may have an impact on its recreational potential or its operability if a watershed is threatened. Nine percent of the State's commercial forest is within one-fourth mile of open water—a lake at least 5 acres in size or a stream at least 66 feet wide. Another 25 percent is between one-fourth and 1 mile of open water:

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[8] *Less than 1 percent.*

| **Distance to open water** (Miles) | **Area of commercial forest land** (Thousand acres) | **Percent** |
|---|---|---|
| 0–⅛ | 739.9 | 4 |
| ⅛–¼ | 864.5 | 5 |
| ¼–1 | 4,349.9 | 25 |
| 1–2½ | 6,474.2 | 37 |
| 2½–5 | 4,072.3 | 23 |
| 5–10 | 841.0 | 5 |
| 10–20 | 109.7 | 1 |
| 20+ | 38.0 | ([8]) |
| Total | 17,489.5 | 100 |

---

[8] *Less than 1 percent.*

The largest areas of forest types normally associated with hydric sites (black spruce, northern white-cedar, and tamarack) occur within one-fourth to 5 miles of open water, just as the tabulation above shows for all types. The fact that they grow within or adjacent to swamps or areas of standing water has no effect on this measure of distance to water for swamp conifer types.

# APPENDIX

## ACCURACY OF SURVEY

Forest Inventory and Analysis information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit level. Consequently, the reported figures are estimates only. A measure of reliability of these figures is given by sampling errors. These sampling errors mean the chances are two out of three that the true inventory value is within the limits indicated.

For example, the estimated commercial forest area in Michigan in 1980, 17,489.5 thousand acres has a sampling error of ±0.33 percent (±57.7 thousand acres). Therefore, the commercial forest area from a 100-percent inventory would have a two in three chance of falling between 17,431.8 and 17,547.2 thousand acres.

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for commercial forest area in a particular Unit or county is higher than that for total commercial forest area in the State (table 27 shows the sampling errors for estimates smaller than State totals).

## SURVEY PROCEDURES

The major steps in the survey of Michigan were as follows:

1. A total of 176,976 1-acre points were systematically distributed across aerial photos of the entire State, except the National Forests. To make a preliminary estimate of forest area, these points were classified into land classes (table 4). Next, 83,103 of these points were stereoclassified by forest type, stand-size class, and density. Finally, 13,991 points were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken.

At each forest ground plot location, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre.

2. Under an agreement with the National Forest Eastern Region, North Central Station crews established 10-point variable radius plots on the Hiawatha and Huron-Manistee National Forests in 1976; and the Ottawa National Forest in 1980. National Forest personnel provided the Station with the area of commercial forest land by forest type, stand-size class, and density for the Forest, and the North Central Station computed all area data in the same manner non-National Forest data were computed. Area and volume tables were approved by the Forest staff and the Regional office before publication.

Table 4.—*Number of photo points observed and ground plots visited, by land class, Michigan, 1980*

| Land class | Photo points classified | Photo points stereoclassified | Ground plots visited |
|---|---|---|---|
| Forest land | 82,170 | 82,170 | 7,706 |
| Unproductive forest land | 114 | 114 | 16 |
| Nonforest land | | | |
| with trees | 3,029 | 303 | 182 |
| without trees | 86,327 | 0 | 5,626 |
| water | 4,699 | 0 | 379 |
| Questionable | 637 | 637 | 82 |
| Total | 176,976 | 83,224 | 13,991 |

## COMPARING MICHIGAN'S FOURTH INVENTORY WITH THE THIRD INVENTORY

Data from new forest inventories are often compared with data from earlier inventories to determine trends in forest resources. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so that they are comparable to data from the new survey. A consistency check was made for each Forest Survey Unit in Michigan to ensure that the changes observed between inventories reflect actual changes in the resource and not changes in definitions or procedures.

### Identifying and Correcting Definitional or Procedural Changes

Definitional or procedural changes between the 1966 and 1980 inventories of Michigan included changes in (1) the definitions of ownership classes, (2) the definition of productive-reserved forest land, and (3) the procedures for determining the area of nonforest land by land class.

In 1966, State Forest was a separate owner class and included only land on State Forests. Other forested State-owned land was included under the Other Public ownership class. In 1980, the State owner class included all State land. However, State-owned commercial forest land outside the State Forest areas is small in Michigan and general comparisons may be made between the 1966 and 1980 State estimates.

Some mining companies were called diversified forest industry in 1966 and classed under the Forest Industry ownership class. In 1980 these companies were classed under Miscellaneous Private Corporation ownership class. Therefore, a comparison of statistics for Forest Industry owner between 1966 and 1980 is only possible if Forest Industry and Miscellaneous Private Corporation ownerships are combined in 1980.

During the 1966 forest inventory, Christmas tree plantations were classified as commercial forest land, whereas they are now classified as productive-reserved forest land. The 1966 commercial forest and productive-reserved areas were adjusted so that they are comparable to 1980 estimates.

In the 1966 forest inventory, the 1964 Census of Agriculture estimates of cropland, pasture, and rangeland areas were used in our inventory report tables. The 1980 inventory estimates of cropland, pasture, and rangeland come from aerial photo interpretation done by Forest Inventory and Analysis personnel in St. Paul. The published 1966 estimates of cropland, pasture, and rangeland areas were adjusted to be compatible with 1980 estimates.

## TREE SPECIES GROUPS IN MICHIGAN[9]

| | |
|---|---|
| Softwoods | |
| Eastern white pine | *Pinus strobus* |
| Red pine | *Pinus resinosa* |
| Jack pine | *Pinus banksiana* |
| White spruce | *Picea glauca* |
| Black spruce | *Picea mariana* |
| Balsam fir | *Abies balsamea* |
| Eastern hemlock | *Tsuga canadensis* |
| Tamarack | *Larix laricina* |
| Northern white-cedar | *Thuja occidentalis* |
| Other softwoods | |
| Eastern redcedar | *Juniperus virginiana* |
| Norway spruce | *Picea abies* |
| Engelmann spruce | *Picea engelmannii* |
| Austrian pine | *Pinus nigra* |
| Scotch pine | *Pinus sylvestris* |
| Hardwoods | |
| White oaks | |
| White oak | *Quercus alba* |
| Swamp white oak | *Quercus bicolor* |
| Bur oak | *Quercus macrocarpa* |
| Chinkapin oak | *Quercus muehlenbergii* |
| Chestnut oak | *Quercus prinus* |
| Select red oak | |
| Northern Red oak | *Quercus rubra* |
| Other red oaks | |
| Scarlet oak | *Quercus coccinea* |
| Northern pin oak | *Quercus ellipsoidalis* |
| Pin oak | *Quercus palustris* |
| Black oak | *Quercus velutina* |
| Hickories | |
| Bitternut hickory | *Carya cordiformis* |
| Pignut hickory | *Carya glabra* |
| Shellbark hickory | *Carya laciniosa* |
| Shagbark hickory | *Carya ovata* |
| Mockernut hickory | *Carya tomentosa* |
| Yellow birch | *Betula alleghaniensis* |
| Hard maples | |
| Sugar maple | *Acer saccharum* |
| Black maple | *Acer nigrum* |
| Soft maples | |
| Red maple | *Acer rubrum* |
| Silver maple | *Acer saccharinum* |
| American beech | *Fagus grandifolia* |
| Ashes | |
| White ash | *Fraxinus americana* |
| Black ash | *Fraxinus nigra* |
| Green ash | *Fraxinus pennsylvanica* |
| Balsam poplar | *Populus balsamifera* |
| Eastern cottonwood | *Populus deltoides* |
| Aspens | |
| Bigtooth aspen | *Populus grandidentata* |
| Quaking aspen | *Populus tremuloides* |
| Basswood | *Tilia americana* |
| Yellow poplar | *Liriodendron tulipifera* |
| Black walnut | *Juglans nigra* |
| Black cherry | *Prunus serotina* |
| Butternut | *Juglans cinerea* |
| Elms | |
| American elm | *Ulmus americana* |
| Slippery elm | *Ulmus rubra* |
| Rock elm | *Ulmus thomasii* |
| Paper birch | *Betula papyrifera* |
| Other hardwoods | |
| Boxelder | *Acer negundo* |
| Sweet birch | *Betula lenta* |
| River birch | *Betula nigra* |
| Black willow | *Salix nigra* |
| Ohio buckeye | *Aesculus glabra* |
| Flowering dogwood | *Cornus florida* |
| Honeylocust | *Gleditsia triacanthos* |
| Osage orange | *Maclura pomifera* |

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[9] *The common and scientific names are based on: Little, Elbert L. Check list of native and naturalized trees of the United States. Agric. Handb. 541. Washington, DC: U.S. Department of Agriculture, Forest Service, 1979. 375 p.*

| | |
|---|---|
| Black tupelo | *Nyssa sylvatica var. sylvatica* |
| Sycamore | *Platanus occidentalis* |
| Black locust | *Robinia pseudoacacia* |
| Sassafras | *Sassafras albidum* |
| Red mulberry | *Morus rubra* |
| American chestnut | *Castanea dentata* |

# METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International ¼-inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.
1 pound = 0.454 kilogram.
1 ton = 0.907 metric ton.

# DEFINITION OF TERMS

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

**County and municipal land.**—Land owned by counties and local public agencies or municipalities, or land leased to these governmental units for 50 years or more.

**Cropland.**—Land under cultivation within the past 24 months, including cropland harvested, crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, and land in soil improved crops, but excluding land cultivated in developing improved pasture.

**Diameter classes.**—A classification of trees based on diameter outside bark, measured at breast height (4½ feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Inventory and Analysis tables, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h.).

**Farm.**—Any place from which $1,000 or more of agricultural products were sold or normally would have been sold during the year.

**Farmer-owned land.**—Land owned by farm operators. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparing basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet wide. Also see definitions for land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, and water.

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest trees.**—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

**Forest type.**—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Michigan are:

*Jack pine.*—Forests in which jack pine comprises a plurality of the stocking. (Common associates include eastern white pine, red pine, aspen, birch, and maple.)

*Red pine.*—Forests in which red pine comprises a plurality of the stocking. (Common associates include eastern white pine, jack pine, aspen, birch, and maple.)

*White pine.*—Forests in which eastern white pine comprises a plurality of the stocking. (Common associates include red pine, jack pine, aspen, birch, and maple.)

*Balsam fir.*—Forests in which balsam fir and white spruce comprise a plurality of stocking with balsam fir the most common. (Common associates include white spruce, aspen, maple, birch, northern white-cedar, and tamarack.)

*White spruce.*—Forests in which white spruce and balsam fir comprise a plurality of the stocking with white spruce the most common. (Common associates include balsam fir, aspen, maple, birch, northern white-cedar, and tamarack.)

*Black spruce.*—Forests in which swamp conifers comprise a plurality of the stocking with black spruce the most common. (Common associates include tamarack and northern white-cedar.)

*Northern white-cedar.*—Forests in which swamp conifers comprise a plurality of the stocking with northern white-cedar the most common. (Common associates include tamarack and black spruce.)

*Tamarack.*—Forests in which swamp conifers comprise a plurality of the stocking with tamarack the most common. (Common associates include black spruce and northern white-cedar.)

*Oak-hickory.*—Forests in which northern red oak, white oak, bur oak, or hickories, singly or in combination, comprise a plurality of the stocking. (Common associates include jack pine, beech, yellow-poplar, elm, and maple.)

*Elm-ash-soft maple.*—Forests in which lowland elm, ash, cottonwood, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include birch, spruce, and balsam fir.)

*Maple-birch.*—Forests in which sugar maple, basswood, yellow birch, upland American elm, and red maple, singly or in combination, comprise a plurality of the stocking. (Common associates include white pine, elm, hemlock, and basswood.)

*Aspen.*—Forests in which quaking aspen or bigtooth aspen, singly or in combination, comprise a plurality of the stocking. (Common associates include balsam poplar, balsam fir, and paper birch.)

*Paper birch.*—Forests in which paper birch comprises a plurality of the stocking. (Common associates include maple, aspen, and balsam fir.)

*Exotic.*—Forests in which species not native to Michigan comprise a plurality of the stocking. (Mostly Scotch pine in plantations.)

**Gross area.**—The entire area of land and water as determined by the Bureau of the Census, 1970.

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Hardwoods.**.—Dicotyledonous trees, usually broad-leaved and deciduous.

**Idle farmland.**—Includes former cropland, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

**Improved pasture.**—Land currently improved for grazing, by cultivation, seeding, irrigation, or clearing of trees or brush and less than 16.7 percent stocked with live trees.

**Indian land.**—Tribal land held in fee but administered by the Federal Government.

**Land area.**—A. *Bureau of the Census.*—The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river floodplains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Inventory and Analysis.*—The same as the Bureau of the Census, except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

**Maintained road.**—Any road, hard-topped or other surfaces, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

**Marsh.**—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

**Miscellaneous federal land.**—Federal land other than National Forest, and land administered by the Bureau of Land Management.

**Miscellaneous private land.**—Privately owned land other than forest-industry and farmer-owned land.

**National Forest land.**—Federal land that has been legally designated as National Forest or purchase units, and other land under the administration of the USDA Forest Service.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land. (See individual definitions).

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide and more than 1 acre in area to qualify as nonforest land.)

a. *Nonforest land without trees.*—Nonforest land with no live trees present.

b. *Nonforest land with trees.*—Nonforest land with one or more trees per acre at least 5 inches d.b.h.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Ownership.**—Property owned by one owner, regardless of the number of parcels in a specified area.

**Ownership size class.**—The amount of commercial forest land owned by one owner, regardless of the number or parcels.

**Owner tenure.**—The length of time a property has been held by the owner.

**Pasture and range.**—Land that is currently improved for grazing by cultivation, seeding, or irrigation, plus land on which the natural plant cover is composed principally of native grasses, forbs, or shrubs valuable as forage.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. The physiographic classes are:

*Xeric sites.*—Very dry soils where excessive drainage seriously limits both growth and species occurrence. Example: sandy jack pine plains.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. Example: dry oak ridge.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. Example: better drained bottomland hardwood sites.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence. Example: wet, frequently flooded river bottoms and spruce bogs.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land but withdrawn from timber utilization through statute, administrative regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Sapling-seedling stands.**—(See stand-size class.)

**Sawtimber stands.**—(See stand-size class.)

**Seedlings.**—Live trees less than 1.0 inch d.b.h. that are expected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Site class.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-area class.**—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

**Stand-size class.**—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings:

a. *Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

b. *Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

c. *Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

d. *Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

**State land.**—Land owned by States, or land leased to these governmental units for 50 years or more.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.)

**Urban and other areas.**—Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards; cemeteries; roads; railroads; airports; beaches; powerlines and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than one-eighth of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or shows evidence of grazing.

**Wooded strip.**—An acre or more of natural continuous forest land that would otherwise meet Forest Inventory and Analysis standards for commercial forest land except that it is less than 120 feet wide.

# TABLES

Table 1.—Area of commercial forest land, Michigan, 1966 and 1980, and percent change between surveys

Table 2.—Area of commercial forest land by treatment or damage class and owner group, 1966-1980

Table 3.—Area of commercial forest land by forest type and physiographic class

Table 4.—Number of photo points observed and ground plots visited, by land class, 1980

Table 5.—Area of land by land class, 1966 and 1980

Table 6.—Area of land by land use class and Forest Survey Unit

Table 7.—Area of commercial forest land by ownership class and Forest Survey Unit

Table 8.—Area of land and forest land by county and Forest Survey Unit

Table 9.—Area of commercial forest land by ownership class and site class

Table 10.—Area of commercial forest land by ownership class and stand-volume class

Table 11.—Area of privately owned commercial forest land by ownership class, owner tenure, and size of holding

Table 12.—Area of commercial forest land by forest type, stand-size class, and ownership class

Table 13.—Area of commercial forest land by forest type and Forest Survey Unit

Table 14.—Area of commercial forest land by county, stand-size class, and Forest Survey Unit

Table 15.—Area of commercial forest land by forest type, stand-size class, and site class

Table 16.—Area of commercial forest land by forest type and stand-age class

Table 17.—Area of commercial forest land by forest type, site-index class, and Forest Survey Unit

Table 18.—Area of commercial forest land by forest type, stand-size class, and basal-area class

Table 19.—Area of commercial forest land by stocking class of growing-stock trees and stand-size class

Table 20.—Area of commercial forest land by stocking class based on selected stand components

Table 21.—Area of noncommercial forest land by ownership class

Table 22.—Area of noncommercial forest land by forest type

Table 23.—Area of nonforest land with trees by forest type and land use

Table 24.—Area of plantations by forest type and stand-age class

Table 25.—Area of plantations by forest type and site-index class

Table 26.—Number of growing-stock trees by species group and forest type in plantations

Table 27.—Sampling errors for estimates of commercial forest area smaller than state totals

Table 5.--Area of land by land class, Michigan 1966[1] and 1980

(In thousand acres)

| Land class | 1966[1] | 1980 |
|---|---|---|
| FOREST LAND | | |
| Commercial forest | | |
| Jack pine | 883.5 | 836.7 |
| Red pine | 594.8 | 655.9 |
| White pine | 147.9 | 214.1 |
| Balsam fir-white spruce | 1,071.9 | 735.5 |
| Black spruce | 421.1 | 520.6 |
| Northern white-cedar | 1,166.0 | 1,173.6 |
| Tamarack | 168.9 | 114.8 |
| Oak-hickory | 2,360.9 | 1,773.6 |
| Elm-ash-soft maple | 1,897.1 | 1,326.4 |
| Maple-birch | 5,215.8 | 6,098.4 |
| Aspen | 4,150.4 | 3,406.6 |
| Paper birch | 416.5 | 374.8 |
| Exotic | 86.2 | 86.3 |
| Nonstocked | 276.3 | 172.2 |
| Subtotal | 18,857.3 | 17,489.5 |
| Noncommercial forest land | | |
| Unproductive | 205.0 | 257.2 |
| Productive-reserved | 311.1 | 622.1 |
| Subtotal | 516.1 | 879.3 |
| Total | 19,373.4 | 18,368.8 |
| NONFOREST LAND | | |
| Cropland | 9,713.8 | 12,292.7 |
| Pasture and range | 1,624.6 | 1,338.5 |
| Other | 5,780.3 | 4,362.9 |
| Total | 17,118.7 | 17,994.1 |
| TOTAL LAND | [2] 36,492.1 | [3] 36,362.9 |
| WATER (BUREAU OF THE CENSUS) | [2] 766.1 | [3] 895.3 |
| TOTAL LAND AND WATER | [2] 37,258.2 | [3] 37,258.2 |

[1] Figures have been adjusted from those published after the 1966 survey to conform to 1980 areas because of changes in survey procedures and definitions.

[2] U.S. Department of Commerce, Bureau of Census. 1950.

[3] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20, No. 1.

Table 6.--Area of land by land use class and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| Land use class | All Units | Forest Survey Unit: Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| FOREST LAND | | | | | |
| Commercial forest | 17,489.5 | 3,801.6 | 4,529.6 | 6,694.9 | 2,463.4 |
| Unproductive forest | 257.2 | 102.4 | 62.2 | 87.7 | 4.9 |
| Productive reserved | 622.1 | 127.6 | 266.7 | 147.0 | 80.8 |
| Total | 18,368.8 | 4,031.6 | 4,858.5 | 6,929.6 | 2,549.1 |
| NONFOREST LAND | | | | | |
| Nonforest with trees | | | | | |
| Cropland with trees | 96.8 | 3.4 | 3.5 | 46.7 | 43.2 |
| Improved pasture with trees | 82.2 | 2.5 | 12.7 | 62.3 | 4.7 |
| Wooded strips | 241.3 | 24.9 | -- | 33.8 | 182.6 |
| Idle farmland with trees | 12.8 | 1.8 | -- | 2.3 | 8.7 |
| Marsh with trees | 235.3 | 49.0 | 15.1 | 97.8 | 73.4 |
| Urban and other windbreaks | -- | -- | -- | -- | -- |
| Windbreaks | 37.5 | 1.7 | -- | 7.5 | 28.3 |
| Wooded pasture | 13.4 | -- | 1.8 | 2.2 | 9.4 |
| Subtotal | 719.3 | 83.3 | 33.1 | 252.6 | 350.3 |
| Nonforest without trees | | | | | |
| Cropland without trees | 11,718.3 | 446.4 | 189.2 | 2,384.1 | 8,698.6 |
| Improved pasture without trees | 1,254.5 | 1.8 | 141.5 | 692.5 | 418.7 |
| Idle farm without trees | 19.8 | 2.0 | -- | 2.5 | 15.3 |
| Marsh without trees | 628.5 | 240.3 | 89.1 | 166.7 | 132.4 |
| Other farm-farmstead | 477.6 | 17.4 | 31.8 | 172.4 | 256.0 |
| Urban and other | 3,105.6 | 162.5 | 183.2 | 727.6 | 2,032.3 |
| Noncensus water | 70.5 | 13.7 | -- | 22.7 | 34.1 |
| Subtotal | 17,274.8 | 884.1 | 634.8 | 4,168.5 | 11,587.4 |
| Total | 17,994.1 | 967.4 | 667.9 | 4,421.1 | 11,937.7 |
| TOTAL LAND | [1]36,362.9 | 4,999.0 | 5,526.4 | 11,350.7 | 14,486.8 |
| WATER (BUREAU OF THE CENSUS) | [1]895.3 | 165.8 | 167.0 | 362.6 | 199.9 |
| TOTAL LAND AND WATER | [1]37,258.2 | 5,164.8 | 5,693.4 | 11,713.3 | 14,686.7 |

[1] U.S. Department of Commerce, Bureau of Census, 1970. Area Measurement Reports, GE-20 No. 1.

Table 7.--Area of commercial forest land by ownership class and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| Ownership Class | All Units | Forest Survey Unit: Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
|---|---|---|---|---|---|
| National Forest | 2,441.5 | 741.4 | 827.7 | 859.5 | 12.9 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- |
| Miscellaneous federal | 44.9 | 20.6 | 1.6 | 15.1 | 7.6 |
| Indian | 22.3 | 6.0 | 16.3 | -- | -- |
| State | 3,571.3 | 976.6 | 620.3 | 1,825.1 | 149.3 |
| County and municipal | 186.7 | 8.9 | 87.6 | 37.6 | 52.6 |
| Forest industry | 1,980.8 | 635.5 | 1,269.3 | 76.0 | -- |
| Farmer | 3,097.7 | 478.2 | 194.1 | 1,274.5 | 1,150.9 |
| Misc. private-corp. | 1,510.5 | 227.9 | 668.4 | 474.0 | 140.2 |
| Misc. private-indiv. | 4,633.8 | 706.5 | 844.3 | 2,133.1 | 949.9 |
| All owners | 17,489.5 | 3,801.6 | 4,529.6 | 6,694.9 | 2,463.4 |

Table 8.--Area of land and forest land by county and Forest Survey Unit, Michigan, 1980

| County | All land[1] | Forest land[2] |  |  | Commercial forest as a percent of land area | All forest as a percent of land area |
|---|---|---|---|---|---|---|
|  |  | All forest | Non commercial[3] | Commercial[4] |  |  |
|  | - - - - - - - - | -Thousand acres- | - - - - - - - - |  | - - - -Percent- | - - - |
|  |  |  | EASTERN UPPER PENINSULA |  |  |  |
| Alger | 578.9 | 530.7 | 38.8 | 491.9 | 85 | 92 |
| Chippewa | 1,017.6 | 757.5 | 51.6 | 705.9 | 69 | 74 |
| Delta | 753.0 | 596.8 | 22.3 | 574.5 | 76 | 79 |
| Luce | 580.1 | 496.5 | 28.1 | 468.4 | 81 | 86 |
| Mackinac | 649.1 | 565.0 | 40.7 | 524.3 | 81 | 87 |
| Menominee | 664.3 | 496.2 | 2.8 | 493.4 | 74 | 75 |
| Schoolcraft | 756.0 | 588.9 | 45.7 | 543.2 | 72 | 78 |
| Total | 4,999.0 | 4,031.6 | 230.0 | 3,801.6 | 76 | 81 |
|  |  |  | WESTERN UPPER PENINSULA |  |  |  |
| Baraga | 576.5 | 539.8 | 26.6 | 513.2 | 89 | 94 |
| Dickinson | 484.6 | 381.0 | 4.4 | 376.6 | 78 | 79 |
| Gogebic | 708.4 | 654.6 | 34.7 | 619.9 | 88 | 92 |
| Houghton | 650.9 | 533.7 | 20.0 | 513.7 | 79 | 82 |
| Iron | 749.5 | 664.7 | 10.7 | 654.0 | 87 | 89 |
| Keweenaw | 344.1 | 333.1 | 126.0 | 207.1 | 60 | 97 |
| Marquette | 1,170.4 | 1,026.9 | 56.5 | 970.4 | 83 | 88 |
| Ontonagon | 842.0 | 724.7 | 50.0 | 674.7 | 80 | 86 |
| Total | 5,526.4 | 4,858.5 | 328.9 | 4,529.6 | 82 | 88 |
|  |  |  | NORTHERN LOWER PENINSULA |  |  |  |
| Alcona | 433.6 | 318.9 | 12.4 | 306.5 | 71 | 74 |
| Alpena | 361.3 | 222.6 | 4.9 | 217.7 | 60 | 62 |
| Antrim | 304.3 | 159.9 | 3.3 | 156.6 | 51 | 53 |
| Arenac | 235.2 | 94.4 | 1.7 | 92.7 | 39 | 40 |
| Bay | 286.2 | 20.1 | 2.3 | 17.8 | 6 | 7 |
| Benzie | 201.9 | 131.0 | 9.9 | 121.1 | 60 | 65 |
| Charlevoix | 265.1 | 139.1 | 0.5 | 138.6 | 52 | 52 |
| Cheboygan | 461.2 | 383.0 | 16.4 | 366.6 | 79 | 83 |
| Clare | 365.4 | 219.9 | 4.2 | 215.7 | 59 | 60 |
| Crawford | 359.3 | 304.8 | 31.9 | 272.9 | 76 | 85 |
| Emmet | 294.7 | 202.2 | 7.0 | 195.2 | 66 | 69 |
| Gladwin | 322.2 | 193.1 | 0.3 | 192.8 | 60 | 60 |
| Grand Traverse | 295.8 | 154.4 | 2.2 | 152.2 | 51 | 52 |
| Iosco | 347.9 | 231.9 | 7.3 | 224.6 | 65 | 67 |
| Isabella | 365.9 | 78.4 | -- | 78.4 | 21 | 21 |
| Kalkaska | 362.0 | 275.3 | 22.0 | 253.3 | 70 | 76 |
| Lake | 365.3 | 300.0 | 0.2 | 299.8 | 82 | 82 |
| Leelanau | 220.5 | 94.1 | 18.3 | 75.8 | 34 | 43 |
| Manistee | 353.9 | 225.7 | 0.2 | 225.5 | 64 | 64 |
| Mason | 313.4 | 156.0 | 8.0 | 148.0 | 47 | 50 |
| Mecosta | 358.4 | 125.2 | 2.5 | 122.7 | 34 | 35 |
| Midland | 332.7 | 149.8 | 2.3 | 147.5 | 44 | 45 |
| Missaukee | 361.3 | 212.5 | 8.1 | 204.4 | 57 | 59 |
| Montmorency | 355.2 | 302.3 | 0.3 | 302.0 | 85 | 85 |
| Newaygo | 543.7 | 316.3 | 6.3 | 310.0 | 57 | 58 |

(Table 8 continued on next page)

(Table 8 continued)

NORTHERN LOWER PENINSULA

| County | All land[1] | Forest land[2] |  |  | Commercial forest as a percent of land area | All forest as a percent of land area |
|---|---|---|---|---|---|---|
|  |  | All forest | Non commercial[3] | Commercial[4] |  |  |
|  | - - - - - - - - | -Thousand acres- | - - - - - - - - |  | - - - -Percent- | - - - |
| Oceana | 343.2 | 160.0 | 11.7 | 148.3 | 43 | 47 |
| Ogemaw | 365.7 | 235.3 | 15.8 | 219.5 | 60 | 64 |
| Osceola | 371.8 | 158.5 | 1.7 | 156.8 | 42 | 43 |
| Oscoda | 360.2 | 309.9 | 2.7 | 307.2 | 85 | 86 |
| Otsego | 337.5 | 262.9 | 2.1 | 260.8 | 77 | 78 |
| Presque Isle | 414.6 | 277.6 | 10.7 | 266.9 | 64 | 67 |
| Roscommon | 333.4 | 252.8 | 6.1 | 246.7 | 74 | 76 |
| Wexford | 357.9 | 261.7 | 11.4 | 250.3 | 70 | 73 |
| Total | 11,350.7 | 6,929.6 | 234.7 | 6,694.9 | 59 | 61 |
| SOUTHERN LOWER PENINSULA |  |  |  |  |  |  |
| Allegan | 528.6 | 137.4 | -- | 137.4 | 26 | 26 |
| Barry | 354.7 | 119.9 | 8.7 | 111.2 | 31 | 34 |
| Berrien | 371.0 | 67.3 | 1.2 | 66.1 | 18 | 18 |
| Branch | 323.8 | 44.1 | -- | 44.1 | 14 | 14 |
| Calhoun | 453.8 | 76.5 | 0.5 | 76.0 | 17 | 17 |
| Cass | 314.0 | 54.0 | -- | 54.0 | 17 | 17 |
| Clinton | 366.0 | 31.0 | 0.5 | 30.5 | 8 | 8 |
| Eaton | 365.5 | 45.5 | -- | 45.5 | 12 | 12 |
| Genesee | 410.9 | 44.0 | -- | 44.0 | 11 | 11 |
| Gratiot | 361.9 | 27.4 | -- | 27.4 | 8 | 8 |
| Hillsdale | 384.3 | 45.6 | 0.6 | 45.0 | 12 | 12 |
| Huron | 524.1 | 57.3 | 1.3 | 56.0 | 11 | 11 |
| Ingham | 357.7 | 42.1 | -- | 42.1 | 12 | 12 |
| Ionia | 367.8 | 38.6 | 1.4 | 37.2 | 10 | 10 |
| Jackson | 446.8 | 87.4 | 4.0 | 83.4 | 19 | 20 |
| Kalamazoo | 359.5 | 73.4 | 6.8 | 66.6 | 19 | 20 |
| Kent | 548.5 | 123.6 | 1.0 | 122.6 | 22 | 23 |
| Lapeer | 420.9 | 83.6 | 2.5 | 81.1 | 19 | 20 |
| Lenawee | 481.9 | 48.2 | 0.5 | 47.7 | 10 | 10 |
| Livingston | 366.1 | 78.2 | 9.0 | 69.2 | 19 | 21 |
| Macomb | 307.3 | 46.2 | 1.2 | 45.0 | 15 | 15 |
| Monroe | 356.5 | 35.2 | 0.1 | 35.1 | 10 | 10 |
| Montcalm | 455.9 | 145.3 | -- | 145.3 | 32 | 32 |
| Muskegon | 320.9 | 165.8 | 1.2 | 164.6 | 51 | 52 |
| Oakland | 554.6 | 104.2 | 22.1 | 82.1 | 15 | 19 |
| Ottawa | 360.5 | 77.8 | 0.2 | 77.6 | 22 | 22 |
| Saginaw | 520.7 | 82.7 | -- | 82.7 | 16 | 16 |
| St. Clair | 469.6 | 89.0 | 1.1 | 87.9 | 19 | 19 |
| St. Joseph | 323.6 | 59.9 | -- | 59.9 | 19 | 19 |
| Sanilac | 615.0 | 50.2 | 0.1 | 50.1 | 8 | 8 |
| Shiawassee | 345.4 | 52.8 | -- | 52.8 | 15 | 15 |
| Tuscola | 521.5 | 83.7 | -- | 83.7 | 16 | 16 |
| Van Buren | 385.6 | 106.2 | 4.2 | 102.0 | 26 | 28 |
| Washtenaw | 454.7 | 82.8 | 10.8 | 72.0 | 16 | 18 |
| Wayne | 387.2 | 42.2 | 6.7 | 35.5 | 9 | 11 |
| Total | 14,486.8 | 2,549.1 | 85.7 | 2,463.4 | 17 | 18 |
| State total | 36,362.9 | 18,368.8 | 879.3 | 17,489.5 | 48 | 51 |

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[1] 1970 Bureau of the Census estimates.

[2] Land at least 16.7 percent stocked by forest trees of any size, or formerly having such tree cover; excludes land currently developed for nonforest use such as urban or heavily settled residential or resort area, city parks, orchards, improved roads, or improved pasture land. The minimum forest area classified was 1 acre. Roadside, streamside, and shelterbelt strips of timber with a crown width of at least 120 feet and unimproved roads and trails, streams, and clearings in forested areas if less than 120 feet in width were classified as forest.

[3] Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions, and productive public forest land withdrawn from commercial timber production through statute or administrative regulation or exclusive use for Christmas tree production.

[4] Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.

Table 9.--Area of commercial forest land by ownership class and site class, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Site class (cubic feet of growth per acre per year) 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
|---|---|---|---|---|---|---|---|
| National Forest | 2,441.5 | -- | -- | 43.5 | 365.3 | 989.1 | 1,043.6 |
| Bureau of Land Mgmt. | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 44.9 | -- | -- | 1.5 | 8.3 | 12.7 | 22.4 |
| Indian | 22.3 | -- | -- | -- | 1.7 | 14.5 | 6.1 |
| State | 3,571.3 | -- | 3.3 | 75.1 | 596.7 | 1,323.5 | 1,572.7 |
| County and municipal | 186.7 | -- | -- | 4.8 | 49.1 | 70.8 | 62.0 |
| Forest industry | 1,980.8 | -- | -- | 22.6 | 234.5 | 730.1 | 993.6 |
| Farmer | 3,097.7 | -- | -- | 119.7 | 848.0 | 1,236.5 | 893.5 |
| Misc. private-corp. | 1,510.5 | -- | -- | 42.2 | 265.7 | 595.6 | 607.0 |
| Misc. private-indiv. | 4,633.8 | -- | 1.6 | 151.9 | 1,124.3 | 1,906.4 | 1,449.6 |
| All owners | 17,489.5 | -- | 4.9 | 461.3 | 3,493.6 | 6,879.2 | 6,650.5 |

Table 10.--Area of commercial forest land by ownership class and stand-volume class, Michigan, 1980

(In thousand acres)

| Ownership class | All classes | Stand-volume class (board feet[1/]) Less than 1,500 | 1,500 to 5,000 | 5,000+ |
|---|---|---|---|---|
| National Forest | 2,441.5 | 1,132.7 | 963.0 | 345.8 |
| Bureau of Land Mgmt. | -- | -- | -- | -- |
| Miscellaneous federal | 44.9 | 33.9 | 11.0 | -- |
| Indian | 22.3 | 4.7 | 12.7 | 4.9 |
| State | 3,571.3 | 1,804.3 | 1,320.4 | 446.6 |
| County and municipal | 186.7 | 86.3 | 77.1 | 23.3 |
| Forest industry | 1,980.8 | 561.4 | 878.9 | 540.5 |
| Farmer | 3,097.7 | 1,324.7 | 1,255.0 | 518.0 |
| Misc. private-corp. | 1,510.5 | 565.1 | 584.3 | 361.1 |
| Misc. private-indiv. | 4,633.8 | 2,012.7 | 1,859.2 | 761.9 |
| All owners | 17,489.5 | 7,525.8 | 6,961.6 | 3,002.1 |

[1/] International 1/4-inch rule.

Table 11.--Area of privately owned commercial forest land by ownership class, owner tenure, and size of holding, Michigan, 1980

(In thousand acres)

| Ownership class and owner tenure class | Total | Size of holding (acres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-4 | 5-10 | 11-20 | 21-50 | 51-100 | 101-500 | 501-2,500 | 2,501-5,000 | 5001+ |
| Forest Industry | | | | | | | | | | |
| 1-4 years | 372.4 | -- | -- | -- | 1.6 | -- | 1.6 | 6.4 | -- | 362.8 |
| 5-9 years | 115.8 | -- | -- | -- | 2.3 | -- | 1.6 | 4.8 | -- | 107.1 |
| 10-19 years | 441.2 | -- | -- | -- | -- | -- | -- | 3.1 | 4.9 | 433.2 |
| 20+ years | 1,051.4 | -- | 2.7 | -- | -- | 2.3 | 3.3 | 3.1 | 4.3 | 1,035.7 |
| All classes | 1,980.8 | -- | 2.7 | -- | 3.9 | 2.3 | 6.5 | 17.4 | 9.2 | 1,938.8 |
| Farmer | | | | | | | | | | |
| 1-4 years | 503.6 | 13.6 | 22.8 | 51.8 | 118.9 | 116.5 | 155.8 | 16.9 | 5.7 | 1.6 |
| 5-9 years | 530.7 | 3.5 | 46.1 | 38.6 | 136.8 | 141.8 | 141.2 | 21.3 | -- | 1.4 |
| 10-19 years | 766.9 | 6.4 | 43.3 | 67.8 | 166.7 | 187.7 | 249.5 | 37.6 | 3.8 | 4.1 |
| 20+ years | 1,296.5 | 13.4 | 52.2 | 105.6 | 254.1 | 319.5 | 453.8 | 60.2 | 5.6 | 32.1 |
| All classes | 3,097.7 | 36.9 | 164.4 | 263.8 | 676.5 | 765.5 | 1,000.3 | 136.0 | 15.1 | 39.2 |
| Misc. priv.-corporation | | | | | | | | | | |
| 1-4 years | 156.6 | 2.7 | 4.2 | 2.2 | 6.4 | 5.2 | 41.4 | 42.1 | 6.2 | 46.2 |
| 5-9 years | 203.1 | -- | 3.6 | 2.6 | 13.8 | 29.0 | 55.3 | 43.4 | 10.8 | 44.6 |
| 10-19 years | 345.2 | -- | 2.7 | 4.1 | 12.6 | 8.3 | 44.0 | 34.8 | 8.7 | 230.0 |
| 20+ years | 805.6 | -- | -- | -- | 19.2 | 47.8 | 65.0 | 90.3 | 8.6 | 574.7 |
| All classes | 1,510.5 | 2.7 | 10.5 | 8.9 | 52.0 | 90.3 | 205.7 | 210.6 | 34.3 | 895.5 |
| Misc. priv.-individual | | | | | | | | | | |
| 1-4 years | 1,177.4 | 47.2 | 83.6 | 116.2 | 316.3 | 224.9 | 275.0 | 87.6 | 6.2 | 20.4 |
| 5-9 years | 1,021.8 | 34.5 | 87.3 | 116.5 | 320.6 | 164.0 | 234.7 | 57.6 | 1.8 | 4.8 |
| 10-19 years | 1,034.2 | 23.9 | 32.0 | 61.6 | 271.9 | 223.8 | 319.5 | 87.1 | 9.4 | 5.0 |
| 20+ years | 1,400.4 | 34.8 | 55.0 | 117.6 | 379.8 | 278.0 | 383.2 | 130.3 | 1.6 | 20.1 |
| All classes | 4,633.8 | 140.4 | 257.9 | 411.9 | 1,288.6 | 890.7 | 1,212.4 | 362.6 | 19.0 | 50.3 |
| All private owners | | | | | | | | | | |
| 1-4 years | 2,210.0 | 63.5 | 110.6 | 170.2 | 443.2 | 346.6 | 473.8 | 153.0 | 18.1 | 431.0 |
| 5-9 years | 1,871.4 | 38.0 | 137.0 | 157.7 | 473.5 | 334.8 | 432.8 | 127.1 | 12.6 | 157.9 |
| 10-19 years | 2,587.5 | 30.3 | 78.0 | 133.5 | 451.2 | 419.8 | 613.0 | 162.6 | 26.8 | 672.3 |
| 20+ years | 4,553.9 | 48.2 | 109.9 | 223.2 | 653.1 | 647.6 | 905.3 | 283.9 | 20.1 | 1,662.6 |
| All classes | 11,222.8 | 180.0 | 435.5 | 684.6 | 2,021.0 | 1,748.8 | 2,424.9 | 726.6 | 77.6 | 2,923.8 |

Table 12.--Area of commercial forest land by forest type, stand-size class, and ownership class, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All owners | Ownership class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | National Forest | Bureau of Land Mgmt. | Misc. federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Jack pine | | | | | | | | | | | |
| Sawtimber | 163.8 | 2.4 | -- | 2.9 | -- | 93.6 | 4.8 | 4.8 | 7.0 | 14.9 | 33.4 |
| Poletimber | 454.9 | 204.1 | -- | 4.2 | -- | 162.8 | 4.2 | 5.9 | 8.0 | 10.9 | 54.8 |
| Sapling & seedling | 218.0 | 61.9 | -- | 1.8 | -- | 104.0 | 8.3 | 1.2 | 10.6 | -- | 30.2 |
| All stands | 836.7 | 268.4 | -- | 8.9 | -- | 360.4 | 17.3 | 11.9 | 25.6 | 25.8 | 118.4 |
| Red pine | | | | | | | | | | | |
| Sawtimber | 140.0 | 26.9 | -- | 1.9 | -- | 59.7 | 3.3 | 1.7 | 16.4 | 7.2 | 22.9 |
| Poletimber | 329.2 | 168.0 | -- | -- | -- | 70.8 | 4.7 | 3.1 | 34.9 | 16.9 | 30.8 |
| Sapling & seedling | 186.7 | 124.7 | -- | -- | -- | 30.4 | 1.7 | -- | 7.5 | 3.9 | 18.5 |
| All stands | 655.9 | 319.6 | -- | 1.9 | -- | 160.9 | 9.7 | 4.8 | 58.8 | 28.0 | 72.2 |
| White pine | | | | | | | | | | | |
| Sawtimber | 147.5 | 19.2 | -- | -- | -- | 37.3 | -- | 16.9 | 19.5 | 24.6 | 30.0 |
| Poletimber | 40.5 | 3.3 | -- | -- | -- | 13.3 | -- | 1.7 | 4.3 | 4.5 | 13.4 |
| Sapling & seedling | 26.1 | -- | -- | -- | -- | 17.3 | -- | -- | 3.9 | -- | 4.9 |
| All stands | 214.1 | 22.5 | -- | -- | -- | 67.9 | -- | 18.6 | 27.7 | 29.1 | 48.3 |
| Balsam fir | | | | | | | | | | | |
| Sawtimber | 143.0 | 27.1 | -- | 3.1 | -- | 21.2 | -- | 30.6 | 8.3 | 12.4 | 40.3 |
| Poletimber | 315.9 | 68.6 | -- | -- | -- | 61.5 | 1.7 | 52.5 | 25.5 | 37.7 | 68.4 |
| Sapling & seedling | 176.5 | 20.3 | -- | -- | -- | 35.5 | 1.6 | 52.2 | 13.3 | 18.0 | 35.6 |
| All stands | 635.4 | 116.0 | -- | 3.1 | -- | 118.2 | 3.3 | 135.3 | 47.1 | 68.1 | 144.3 |
| White spruce | | | | | | | | | | | |
| Sawtimber | 28,6 | -- | -- | -- | -- | 3.1 | -- | 5.3 | 6.1 | 9.6 | 4.5 |
| Poletimber | 44.7 | -- | -- | -- | -- | 9.8 | -- | 12.8 | 1.7 | 3.0 | 17.4 |
| Sapling & seedling | 26.8 | -- | -- | -- | -- | 9.8 | 2.5 | 2.8 | 2.3 | 1.5 | 7.9 |
| All stands | 100.1 | -- | -- | -- | -- | 22.7 | 2.5 | 20.9 | 10.1 | 14.1 | 29.8 |
| Black spruce | | | | | | | | | | | |
| Sawtimber | 13.7 | -- | -- | -- | -- | 7.7 | -- | 1.5 | -- | 1.2 | 3.3 |
| Poletimber | 261.2 | 130.3 | -- | -- | -- | 53.1 | 1.7 | 25.0 | 7.5 | 6.6 | 37.0 |
| Sapling & seedling | 245.7 | 32.0 | -- | -- | -- | 89.2 | 1.6 | 43.5 | 12.5 | 22.5 | 44.4 |
| All stands | 520.6 | 162.3 | -- | -- | -- | 150.0 | 3.3 | 70.0 | 20.0 | 30.3 | 84.7 |
| Northern white-cedar | | | | | | | | | | | |
| Sawtimber | 305.8 | 5.2 | -- | -- | -- | 75.8 | 3.2 | 74.0 | 29.4 | 55.3 | 62.9 |
| Poletimber | 640.6 | 57.8 | -- | -- | -- | 195.1 | 4.8 | 100.1 | 121.8 | 31.9 | 129.1 |
| Sapling & seedling | 227.2 | 5.3 | -- | -- | 1.6 | 52.8 | 2.8 | 31.3 | 61.1 | 16.7 | 55.6 |
| All stands | 1,173.6 | 68.3 | -- | -- | 1.6 | 323.7 | 10.8 | 205.4 | 212.3 | 103.9 | 247.6 |

(Table 12 continued on next page)

(Table 12 continued)

| Forest type and stand-size class | All owners | Ownership class |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | National Forest | Bureau of Land Mgmt. | Misc. Federal | Indian | State | County & municipal | Forest industry | Farmer | Misc. priv.-corp. | Misc. priv.-indiv. |
| Tamarack |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 12.6 | -- | -- | -- | -- | 2.3 | -- | -- |  | 2.4 | 7.9 |
| Poletimber | 35.5 | -- | -- | -- | -- | 14.9 | -- | 9.8 | 5.3 | -- | 5.5 |
| Sapling & seedling | 66.7 | -- | -- | -- | -- | 27.5 | -- | 10.3 | 5.9 | 3.8 | 19.2 |
| All stands | 114.8 | -- | -- | -- | -- | 44.7 | -- | 20.1 | 11.2 | 6.2 | 32.6 |
| Oak-hickory |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 684.0 | 42.2 | -- | -- | -- | 86.1 | 2.3 | 8.1 | 197.6 | 51.0 | 296.7 |
| Poletimber | 782.2 | 167.2 | -- | -- | -- | 183.0 | 11.0 | 4.9 | 121.5 | 48.3 | 246.3 |
| Sapling & seedling | 307.4 | 37.0 | -- | 10.8 | -- | 71.8 | 5.9 | -- | 45.0 | 19.4 | 117.5 |
| All stands | 1,773.6 | 246.4 | -- | 10.8 | -- | 340.9 | 19.2 | 13.0 | 364.1 | 118.7 | 660.5 |
| Elm-ash-soft maple |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 453.5 | 15.9 | -- | 4.2 | 1.5 | 59.2 | 8.0 | 34.3 | 144.9 | 49.3 | 136.2 |
| Poletimber | 471.1 | 25.1 | -- | -- | -- | 65.6 | 8.4 | 42.3 | 159.4 | 33.8 | 136.5 |
| Sapling & seedling | 401.8 | -- | -- | -- | -- | 60.3 | 6.9 | 24.5 | 135.7 | 45.9 | 128.5 |
| All stands | 1,326.4 | 41.0 | -- | 4.2 | 1.5 | 185.1 | 23.3 | 101.1 | 440.0 | 129.0 | 401.2 |
| Maple-birch |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 2,479.7 | 230.0 | -- | -- | 3.2 | 286.6 | 17.1 | 693.3 | 413.6 | 270.4 | 565.5 |
| Poletimber | 2,568.2 | 442.8 | -- | 1.6 | 9.3 | 380.9 | 38.9 | 306.5 | 482.3 | 218.1 | 687.8 |
| Sapling & seedling | 1,050.5 | 14.9 | -- | 3.4 | -- | 179.1 | 6.6 | 105.3 | 316.0 | 97.0 | 328.2 |
| All stands | 6,098.4 | 687.7 | -- | 5.0 | 12.5 | 846.6 | 62.6 | 1,105.1 | 1,211.9 | 585.5 | 1,581.5 |
| Aspen |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 533.8 | 20.9 | -- | -- | -- | 116.1 | 5.5 | 25.3 | 127.9 | 69.9 | 168.2 |
| Poletimber | 1,504.5 | 263.3 | -- | 6.4 | 5.1 | 286.0 | 14.6 | 88.1 | 255.8 | 112.7 | 472.5 |
| Sapling & seedling | 1,368.3 | 168.0 | -- | 1.5 | 1.6 | 430.7 | 9.3 | 96.9 | 172.4 | 111.2 | 376.7 |
| All stands | 3,406.6 | 452.2 | -- | 7.9 | 6.7 | 832.8 | 29.4 | 210.3 | 556.1 | 293.8 | 1,017.4 |
| Paper birch |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 35.2 | 1.9 | -- | -- | -- | 4.7 | -- | 12.7 | -- | 6.6 | 9.3 |
| Poletimber | 269.9 | 39.2 | -- | 1.5 | -- | 64.0 | -- | 36.3 | 40.8 | 38.0 | 50.1 |
| Sapling & seedling | 69.7 | -- | -- | -- | -- | 4.3 | 5.3 | 11.7 | 15.9 | 3.3 | 29.2 |
| All stands | 374.8 | 41.1 | -- | 1.5 | -- | 73.0 | 5.3 | 60.7 | 56.7 | 47.9 | 88.6 |
| Exotic |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 |
| Poletimber | 35.0 | -- | -- | -- | -- | -- | -- | -- | 13.2 | 2.2 | 19.6 |
| Sapling & seedling | 46.5 | -- | -- | -- | -- | -- | -- | 1.1 | 4.6 | 11.1 | 29.7 |
| All stands | 86.3 | -- | -- | -- | -- | -- | -- | 1.1 | 17.8 | 13.3 | 54.1 |
| Nonstocked | 172.2 | 16.0 | -- | 1.6 | -- | 44.4 | -- | 2.5 | 38.3 | 16.8 | 52.6 |
| All types |  |  |  |  |  |  |  |  |  |  |  |
| Sawtimber | 5,146.0 | 391.7 | -- | 12.1 | 4.7 | 853.4 | 44.2 | 908.5 | 970.7 | 574.8 | 1,385.9 |
| Poletimber | 7,753.4 | 1,569.7 | -- | 13.7 | 14.4 | 1,560.8 | 90.0 | 689.0 | 1,282.0 | 564.6 | 1,969.2 |
| Sapling & seedling | 4,417.9 | 464.1 | -- | 17.5 | 3.2 | 1,112.7 | 52.5 | 380.8 | 806.7 | 354.3 | 1,226.1 |
| Nonstocked | 172.2 | 16.0 | -- | 1.6 | -- | 44.4 | -- | 2.5 | 38.3 | 16.8 | 52.6 |
| All stands | 17,489.5 | 2,441.5 | -- | 44.9 | 22.3 | 3,571.3 | 186.7 | 1,980.8 | 3,097.7 | 1,510.5 | 4,633.8 |

Table 13.--Area of commercial forest land by forest type and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| | | Forest Survey Unit | | | |
|---|---|---|---|---|---|
| Forest type | All Units | Eastern Upper Peninsula | Western Upper Peninsula | Northern Lower Peninsula | Southern Lower Peninsula |
| Jack pine | 836.7 | 229.1 | 88.3 | 506.7 | 12.6 |
| Red pine | 655.9 | 139.8 | 57.6 | 427.0 | 31.5 |
| White pine | 214.1 | 68.7 | 48.7 | 75.2 | 21.5 |
| Balsam fir | 635.4 | 217.4 | 366.6 | 51.4 | -- |
| White spruce | 100.1 | 30.1 | 40.6 | 21.9 | 7.5 |
| Black spruce | 520.6 | 283.1 | 209.5 | 28.0 | -- |
| Northern white-cedar | 1,173.6 | 594.9 | 210.2 | 355.5 | 13.0 |
| Tamarack | 114.8 | 43.8 | 36.0 | 30.6 | 4.4 |
| Oak-hickory | 1,773.6 | 19.3 | 22.6 | 1,068.1 | 663.6 |
| Elm-ash-soft maple | 1,326.4 | 191.8 | 169.7 | 416.3 | 548.6 |
| Maple-birch | 6,098.4 | 1,160.3 | 2,372.4 | 1,662.4 | 903.3 |
| Aspen | 3,406.6 | 671.4 | 733.3 | 1,817.5 | 184.4 |
| Paper birch | 374.8 | 110.5 | 143.8 | 113.9 | 6.6 |
| Exotic | 86.3 | 1.2 | 1.6 | 57.2 | 26.3 |
| Nonstocked | 172.2 | 40.2 | 28.7 | 63.2 | 40.1 |
| All types | 17,489.5 | 3,801.6 | 4,529.6 | 6,694.9 | 2,463.4 |

## Table 14.--Area of commercial forest land by county, stand-size class, and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| County | All stands | Stand-size class: Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
|---|---|---|---|---|---|
| EASTERN UPPER PENINSULA | | | | | |
| Alger | 491.9 | 212.6 | 194.5 | 77.1 | 7.7 |
| Chippewa | 705.9 | 173.5 | 378.6 | 151.4 | 2.4 |
| Delta | 574.5 | 99.2 | 329.4 | 145.2 | 0.7 |
| Luce | 468.4 | 179.8 | 163.3 | 119.4 | 5.9 |
| Mackinac | 524.2 | 122.1 | 283.2 | 111.3 | 7.6 |
| Menonimee | 493.4 | 79.2 | 230.6 | 181.1 | 2.5 |
| Schoolcraft | 543.3 | 139.6 | 245.5 | 144.8 | 13.4 |
| All counties | 3,801.6 | 1,006.0 | 1,825.1 | 930.3 | 40.2 |
| WESTERN UPPER PENINSULA | | | | | |
| Baraga | 513.2 | 283.8 | 154.4 | 72.1 | 2.9 |
| Dickinson | 376.6 | 74.1 | 190.8 | 108.6 | 3.1 |
| Gogebic | 619.9 | 168.3 | 354.3 | 93.5 | 3.8 |
| Houghton | 513.7 | 212.5 | 233.8 | 61.7 | 5.7 |
| Iron | 654.0 | 208.9 | 309.1 | 133.7 | 2.3 |
| Keweenaw | 207.1 | 121.2 | 62.2 | 23.7 | -- |
| Marquette | 970.4 | 367.1 | 436.2 | 161.9 | 5.2 |
| Ontonagon | 674.7 | 211.7 | 363.7 | 93.6 | 5.7 |
| All counties | 4,529.6 | 1,647.6 | 2,104.5 | 748.8 | 28.7 |
| NORTHERN LOWER PENINSULA | | | | | |
| Alcona | 306.5 | 74.8 | 152.0 | 77.4 | 2.3 |
| Alepna | 217.7 | 55.7 | 85.3 | 68.4 | 8.3 |
| Antrim | 156.6 | 25.1 | 107.1 | 22.2 | 2.2 |
| Arenac | 92.7 | 16.2 | 46.5 | 30.0 | -- |
| Bay | 17.8 | 2.0 | 8.8 | 7.0 | -- |
| Benzie | 121.1 | 29.2 | 56.0 | 35.9 | -- |
| Charlevoix | 138.6 | 46.5 | 80.9 | 8.8 | 2.4 |
| Cheboygan | 366.6 | 74.7 | 207.2 | 82.5 | 2.2 |
| Clare | 215.7 | 50.0 | 77.5 | 88.2 | -- |
| Crawford | 272.9 | 35.8 | 136.5 | 100.6 | -- |
| Emmet | 195.2 | 54.1 | 114.2 | 26.9 | -- |
| Gladwin | 192.8 | 36.3 | 89.9 | 64.5 | 2.1 |
| Grand Traverse | 152.2 | 43.6 | 70.8 | 37.8 | -- |
| Iosco | 224.6 | 49.7 | 115.7 | 59.2 | -- |
| Isabella | 78.4 | 24.3 | 20.4 | 30.2 | 3.5 |
| Kalkaska | 253.3 | 39.6 | 129.8 | 76.2 | 7.7 |
| Lake | 299.8 | 67.4 | 162.8 | 69.6 | -- |
| Leelanau | 75.8 | 42.1 | 24.4 | 9.3 | -- |
| Manistee | 225.5 | 57.9 | 83.2 | 75.6 | 8.8 |
| Mason | 148.0 | 40.5 | 70.0 | 35.9 | 1.6 |
| Mecosta | 122.7 | 32.4 | 34.6 | 53.4 | 2.3 |
| Midland | 147.5 | 41.3 | 60.3 | 45.9 | -- |
| Missaukee | 204.4 | 39.7 | 79.2 | 85.5 | -- |
| Montmorency | 302.0 | 40.6 | 107.9 | 141.5 | 12.0 |

(Table 14 continued on next page)

(Table 14 continued)

NORTHERN LOWER PENINSULA

| County | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| Newaygo | 310.0 | 86.6 | 126.1 | 97.3 | -- |
| Oceana | 148.3 | 44.3 | 64.7 | 35.4 | 3.9 |
| Ogemaw | 219.5 | 35.3 | 117.8 | 64.6 | 1.8 |
| Osceola | 156.8 | 66.6 | 39.6 | 50.6 | -- |
| Oscoda | 307.2 | 52.0 | 125.9 | 129.3 | -- |
| Otsego | 260.8 | 43.2 | 137.0 | 80.6 | -- |
| Presque Isle | 266.9 | 54.4 | 125.4 | 87.1 | -- |
| Roscommon | 246.7 | 58.3 | 137.6 | 50.8 | -- |
| Wexford | 250.3 | 48.5 | 142.0 | 57.7 | 2.1 |
| All counties | 6,694.9 | 1,508.7 | 3,137.1 | 1,985.9 | 63.2 |
| SOUTHERN LOWER PENINSULA | | | | | |
| Allegan | 137.4 | 57.0 | 41.8 | 38.6 | -- |
| Barry | 111.2 | 62.0 | 24.4 | 24.8 | -- |
| Berrien | 66.1 | 42.0 | 12.5 | 11.6 | -- |
| Branch | 44.1 | 23.5 | 11.2 | 9.4 | -- |
| Calhoun | 76.1 | 40.5 | 23.0 | 12.6 | -- |
| Cass | 54.0 | 24.6 | 20.6 | 8.8 | -- |
| Clinton | 30.5 | 10.7 | 8.4 | 11.4 | -- |
| Eaton | 45.5 | 15.5 | 18.9 | 11.1 | -- |
| Genesee | 44.0 | 12.3 | 11.7 | 20.0 | -- |
| Gratiot | 27.4 | 13.7 | 6.2 | 7.5 | -- |
| Hillsdale | 45.0 | 12.1 | 9.7 | 17.3 | 5.9 |
| Huron | 56.1 | 14.0 | 19.4 | 18.5 | 4.2 |
| Ingham | 42.1 | 27.0 | 6.6 | 8.5 | -- |
| Ionia | 37.2 | 15.4 | 4.4 | 17.4 | -- |
| Jackson | 83.4 | 41.8 | 20.7 | 20.9 | -- |
| Kalamazoo | 66.6 | 19.8 | 15.5 | 31.3 | -- |
| Kent | 122.6 | 26.8 | 52.1 | 43.7 | -- |
| Lapeer | 81.0 | 36.8 | 19.1 | 25.1 | -- |
| Lenawee | 47.7 | 20.1 | 10.1 | 15.5 | 2.0 |
| Livingston | 69.1 | 45.4 | 16.7 | 7.0 | -- |
| Macomb | 45.0 | 13.5 | -- | 31.5 | -- |
| Monroe | 35.1 | 17.6 | 5.1 | 10.4 | 2.0 |
| Montcalm | 145.3 | 36.9 | 67.1 | 36.6 | 4.7 |
| Muskegon | 164.6 | 62.7 | 49.8 | 46.2 | 5.9 |
| Oakland | 82.2 | 26.9 | 17.8 | 32.9 | 4.6 |
| Ottawa | 77.5 | 39.4 | 11.2 | 26.9 | -- |
| Saginaw | 82.7 | 19.3 | 21.9 | 41.5 | -- |
| St. Clair | 87.9 | 41.4 | 12.5 | 34.0 | -- |
| St. Joseph | 59.9 | 27.0 | 7.4 | 23.7 | 1.8 |
| Sanilac | 50.1 | 4.2 | 9.4 | 32.0 | 4.5 |
| Shiawassee | 52.8 | 25.5 | 17.4 | 9.9 | -- |
| Tuscola | 83.7 | 11.8 | 56.6 | 15.3 | -- |
| Van Buren | 102.0 | 30.5 | 35.5 | 36.0 | -- |
| Washtenaw | 72.0 | 41.6 | 17.8 | 8.1 | 4.5 |
| Wayne | 35.5 | 24.4 | 4.2 | 6.9 | -- |
| All counties | 2,463.4 | 983.7 | 686.7 | 752.9 | 40.1 |
| All units | 17,489.5 | 5,146.0 | 7,753.4 | 4,417.9 | 172.2 |

Table 15.--Area of commercial forest land by forest type, stand-size class, and site class, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Jack pine | | | | | | | |
| Sawtimber | 163.8 | -- | -- | -- | 15.6 | 52.3 | 95.9 |
| Poletimber | 454.9 | -- | -- | -- | 8.7 | 100.4 | 345.8 |
| Sapling & seedling | 218.0 | -- | -- | -- | -- | 22.9 | 195.1 |
| All stands | 836.7 | -- | -- | -- | 24.3 | 175.6 | 636.8 |
| Red pine | | | | | | | |
| Sawtimber | 140.0 | -- | -- | 6.6 | 55.3 | 64.6 | 13.5 |
| Poletimber | 329.2 | -- | -- | 48.4 | 137.9 | 118.7 | 24.2 |
| Sapling & seedling | 186.7 | -- | -- | 6.9 | 37.5 | 129.8 | 12.5 |
| All stands | 655.9 | -- | -- | 61.9 | 230.7 | 313.1 | 50.2 |
| White pine | | | | | | | |
| Sawtimber | 147.5 | -- | -- | 15.7 | 33.7 | 71.1 | 27.0 |
| Poletimber | 40.5 | -- | -- | -- | 9.9 | 22.7 | 7.9 |
| Sapling & seedling | 26.1 | -- | -- | 2.2 | 4.1 | 8.9 | 10.9 |
| All stands | 214.1 | -- | -- | 17.9 | 47.7 | 102.7 | 45.8 |
| Balsam fir | | | | | | | |
| Sawtimber | 143.0 | -- | 1.7 | 23.1 | 57.9 | 45.2 | 15.1 |
| Poletimber | 315.9 | -- | 3.2 | 55.3 | 178.0 | 65.9 | 13.5 |
| Sapling & seedling | 176.5 | -- | -- | 18.2 | 76.4 | 35.6 | 46.3 |
| All stands | 635.4 | -- | 4.9 | 96.6 | 312.3 | 146.7 | 74.9 |
| White spruce | | | | | | | |
| Sawtimber | 28.6 | -- | -- | -- | 4.6 | 17.1 | 6.9 |
| Poletimber | 44.7 | -- | -- | -- | 14.4 | 19.6 | 10.7 |
| Sapling & seedling | 26.8 | -- | -- | -- | 9.8 | 14.7 | 2.3 |
| All stands | 100.1 | -- | -- | -- | 28.8 | 51.4 | 19.9 |
| Black spruce | | | | | | | |
| Sawtimber | 13.7 | -- | -- | -- | -- | 2.9 | 10.8 |
| Poletimber | 261.2 | -- | -- | -- | 13.6 | 29.7 | 217.9 |
| Sapling & seedling | 245.7 | -- | -- | -- | 1.9 | 17.8 | 226.0 |
| All stands | 520.6 | -- | -- | -- | 15.5 | 50.4 | 454.7 |
| Northern white-cedar | | | | | | | |
| Sawtimber | 305.8 | -- | -- | -- | -- | 43.0 | 262.8 |
| Poletimber | 640.6 | -- | -- | -- | 6.9 | 54.3 | 579.4 |
| Sapling & seedling | 227.2 | -- | -- | -- | -- | 13.0 | 214.2 |
| All stands | 1,173.6 | -- | -- | -- | 6.9 | 110.3 | 1,056.4 |

(Table 15 continued on next page)

(Table 15 continued)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth per acre per year) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 225+ | 165-224 | 120-164 | 85-119 | 50-84 | 20-49 |
| Tamarack | | | | | | | |
| Sawtimber | 12.6 | -- | -- | -- | -- | 6.5 | 6.1 |
| Poletimber | 35.5 | -- | -- | -- | 2.3 | 10.7 | 22.5 |
| Sapling & seedling | 66.7 | -- | -- | -- | -- | 9.8 | 56.9 |
| All stands | 114.8 | -- | -- | -- | 2.3 | 27.0 | 85.5 |
| Oak-hickory | | | | | | | |
| Sawtimber | 684.0 | -- | -- | 21.4 | 174.2 | 315.3 | 173.1 |
| Poletimber | 782.2 | -- | -- | -- | 112.9 | 387.3 | 282.0 |
| Sapling & seedling | 307.4 | -- | -- | -- | 26.3 | 136.5 | 144.6 |
| All stands | 1,773.6 | -- | -- | 21.4 | 313.4 | 839.1 | 599.7 |
| Elm-ash-soft maple | | | | | | | |
| Sawtimber | 453.5 | -- | -- | -- | 126.8 | 122.7 | 204.0 |
| Poletimber | 471.1 | -- | -- | -- | 86.6 | 101.5 | 283.0 |
| Sapling & seedling | 401.8 | -- | -- | -- | 26.0 | 115.3 | 260.5 |
| All stands | 1,326.4 | -- | -- | -- | 239.4 | 339.5 | 747.5 |
| Maple-birch | | | | | | | |
| Sawtimber | 2,479.7 | -- | -- | 59.0 | 418.9 | 1,169.2 | 832.6 |
| Poletimber | 2,568.2 | -- | -- | 54.0 | 405.1 | 1,354.0 | 755.1 |
| Sapling & seedling | 1,050.5 | -- | -- | 13.8 | 133.3 | 471.2 | 432.2 |
| All stands | 6,098.4 | -- | -- | 126.8 | 957.3 | 2,994.4 | 2,019.9 |
| Aspen | | | | | | | |
| Sawtimber | 533.8 | -- | -- | 34.3 | 223.7 | 205.3 | 70.5 |
| Poletimber | 1,504.5 | -- | -- | 26.7 | 575.6 | 711.9 | 190.3 |
| Sapling & seedling | 1,368.3 | -- | -- | 44.0 | 462.4 | 592.0 | 269.9 |
| All stands | 3,406.6 | -- | -- | 105.0 | 1,261.7 | 1,509.2 | 530.7 |
| Paper birch | | | | | | | |
| Sawtimber | 35.2 | -- | -- | 2.0 | -- | 6.9 | 26.3 |
| Poletimber | 269.9 | -- | -- | 21.5 | 4.9 | 120.1 | 123.4 |
| Sapling & seedling | 69.7 | -- | -- | -- | 1.5 | 13.4 | 54.8 |
| All stands | 374.8 | -- | -- | 23.5 | 6.4 | 140.4 | 204.5 |
| Exotic | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | 4.8 | -- |
| Poletimber | 35.0 | -- | -- | 3.5 | 22.0 | 4.7 | 4.8 |
| Sapling & seedling | 46.5 | -- | -- | 2.3 | 11.1 | 21.6 | 11.5 |
| All stands | 86.3 | -- | -- | 5.8 | 33.1 | 31.1 | 16.3 |
| Nonstocked | 172.2 | -- | -- | 2.4 | 13.8 | 48.3 | 107.7 |
| All types | | | | | | | |
| Sawtimber | 5,146.0 | -- | 1.7 | 162.1 | 1,110.7 | 2,126.9 | 1,744.6 |
| Poletimber | 7,753.4 | -- | 3.2 | 209.4 | 1,578.8 | 3,101.5 | 2,860.5 |
| Sapling & seedling | 4,417.9 | -- | -- | 87.4 | 790.3 | 1,602.5 | 1,937.7 |
| Nonstocked | 172.2 | -- | -- | 2.4 | 13.8 | 48.3 | 107.7 |
| All stands | 17,489.5 | -- | 4.9 | 461.3 | 3,493.6 | 6,879.2 | 6,650.5 |

Table 16.--Area of commercial forest land by forest type and stand-age class, Michigan, 1980

(In thousand acres)

| Forest type | All ages | Stand-age class (years) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Jack pine | 836.7 | 82.6 | 101.4 | 75.1 | 156.1 | 196.0 | 110.5 | 45.9 | 45.2 | 14.7 | 4.4 | 2.3 | 2.5 | -- |
| Red pine | 655.9 | 56.4 | 135.4 | 182.1 | 117.2 | 69.5 | 12.8 | 23.7 | 17.4 | 14.1 | 9.4 | 16.4 | 1.5 | -- |
| White pine | 214.1 | 7.3 | 12.2 | 17.8 | 5.0 | 18.5 | 15.6 | 33.7 | 26.9 | 24.5 | 22.2 | 13.0 | 12.7 | 4.7 |
| Balsam fir | 635.4 | 51.9 | 73.6 | 52.7 | 69.9 | 117.1 | 94.1 | 57.1 | 42.3 | 22.5 | 14.6 | 23.7 | 11.0 | 4.9 |
| White spruce | 100.1 | 7.0 | 18.6 | 1.2 | 19.8 | 14.0 | 11.6 | 3.3 | 4.8 | 8.0 | -- | 9.6 | -- | 2.2 |
| Black spruce | 520.6 | 58.7 | 67.3 | 129.8 | 72.5 | 50.4 | 51.9 | 35.5 | 17.2 | 3.2 | 7.6 | 13.4 | 7.3 | 5.8 |
| Northern white-cedar | 1,173.6 | 26.9 | 54.6 | 88.4 | 73.6 | 62.6 | 113.7 | 141.4 | 127.0 | 135.2 | 86.5 | 139.2 | 67.2 | 57.3 |
| Tamarack | 114.8 | 20.2 | 15.2 | 16.0 | 11.6 | 5.9 | 18.1 | 10.7 | 5.1 | 1.5 | 4.5 | 3.7 | -- | 2.3 |
| Oak-hickory | 1,773.6 | 162.7 | 135.0 | 20.9 | 100.9 | 194.0 | 291.8 | 204.7 | 190.2 | 157.0 | 93.9 | 166.9 | 44.3 | 11.3 |
| Elm-ash-soft maple | 1,326.4 | 169.2 | 166.5 | 98.0 | 117.0 | 124.9 | 138.8 | 103.4 | 103.4 | 87.8 | 53.1 | 102.5 | 45.9 | 15.9 |
| Maple-birch | 6,098.4 | 506.1 | 423.7 | 192.4 | 376.2 | 896.7 | 891.5 | 504.7 | 408.3 | 475.0 | 442.4 | 618.4 | 269.6 | 93.4 |
| Aspen | 3,406.6 | 708.0 | 576.5 | 149.6 | 358.4 | 516.2 | 481.3 | 238.0 | 158.0 | 95.0 | 66.8 | 50.1 | 8.7 | -- |
| Paper birch | 374.8 | 31.1 | 32.7 | 10.9 | 26.3 | 41.1 | 96.8 | 79.9 | 26.2 | 8.2 | 12.0 | 3.0 | 5.0 | 1.6 |
| Exotic | 86.3 | 11.4 | 27.5 | 28.8 | 9.4 | 2.2 | 7.0 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 172.2 | 98.8 | 40.3 | 10.3 | 8.4 | 5.7 | 5.1 | -- | -- | 3.6 | -- | -- | -- | -- |
| All types | 17,489.5 | 1,998.3 | 1,880.5 | 1,074.0 | 1,522.3 | 2,314.8 | 2,340.6 | 1,482.0 | 1,172.0 | 1,050.3 | 817.4 | 1,162.2 | 475.7 | 199.4 |

Table 17.--Area of commercial forest land by forest type, site-index class, and Forest Survey Unit, Michigan, 1980

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| ALL UNITS | | | | | | | | | | |
| Jack pine | 836.7 | -- | 11.8 | 123.1 | 255.0 | 270.4 | 128.8 | 28.2 | 19.4 | -- |
| Red pine | 655.9 | -- | -- | 2.6 | 146.4 | 214.3 | 161.3 | 92.6 | 38.7 | -- |
| White pine | 214.1 | -- | -- | 17.6 | 41.7 | 89.4 | 36.9 | 20.0 | 8.5 | -- |
| Balsam fir | 635.4 | 2.9 | 9.5 | 62.6 | 176.2 | 268.6 | 90.2 | 10.4 | 11.9 | 3.1 |
| White spruce | 100.1 | -- | 4.7 | 13.6 | 19.2 | 25.8 | 14.4 | 19.7 | 2.7 | -- |
| Black spruce | 520.6 | -- | 50.9 | 226.1 | 177.7 | 50.3 | 13.7 | 1.9 | -- | -- |
| Northern white-cedar | 1,173.6 | 74.7 | 534.1 | 365.8 | 129.4 | 29.5 | 33.2 | 6.9 | -- | -- |
| Tamarack | 114.8 | -- | 17.2 | 40.8 | 27.7 | 18.3 | 8.5 | -- | 2.3 | -- |
| Oak-hickory | 1,773.6 | -- | 2.3 | 65.7 | 310.4 | 463.5 | 456.9 | 303.6 | 130.7 | 40.5 |
| Elm-ash-soft maple | 1,326.4 | -- | 10.0 | 128.1 | 162.0 | 261.2 | 333.8 | 191.8 | 120.3 | 119.2 |
| Maple-birch | 6,098.4 | -- | 21.6 | 120.5 | 562.8 | 1,320.2 | 1,926.0 | 1,404.3 | 564.0 | 179.0 |
| Aspen | 3,406.6 | -- | 2.7 | 55.8 | 214.0 | 592.1 | 969.9 | 954.1 | 512.9 | 105.1 |
| Paper birch | 374.8 | -- | 1.4 | 19.2 | 38.5 | 147.1 | 124.9 | 37.3 | 6.4 | -- |
| Exotic | 86.3 | -- | -- | 4.2 | 22.5 | 20.6 | 28.3 | 9.6 | -- | 1.1 |
| Nonstocked | 172.2 | 1.7 | 4.6 | 17.1 | 60.0 | 54.1 | 14.9 | 15.6 | 4.2 | -- |
| All types | 17,489.5 | 79.3 | 670.8 | 1,262.8 | 2,343.5 | 3,825.4 | 4,341.7 | 3,096.0 | 1,422.0 | 448.0 |
| EASTERN UPPER PENINSULA | | | | | | | | | | |
| Jack pine | 229.1 | -- | 11.8 | 60.4 | 48.3 | 76.7 | 25.1 | 5.2 | 1.6 | -- |
| Red pine | 139.8 | -- | -- | -- | 33.5 | 58.6 | 46.0 | 1.7 | -- | -- |
| White pine | 68.7 | -- | -- | 11.2 | 21.5 | 26.5 | 4.8 | 3.0 | 1.7 | -- |
| Balsam fir | 217.4 | 1.5 | 3.0 | 15.0 | 67.0 | 97.3 | 29.0 | 3.1 | -- | 1.5 |
| White spruce | 30.1 | -- | -- | 6.0 | 7.2 | 2.8 | 11.1 | 3.0 | -- | -- |
| Black spruce | 283.1 | -- | 13.4 | 127.7 | 114.6 | 21.5 | 4.4 | 1.5 | -- | -- |
| Northern white-cedar | 594.9 | 43.0 | 303.3 | 161.6 | 60.1 | 14.3 | 8.0 | 4.6 | -- | -- |
| Tamarack | 43.8 | -- | 4.6 | 19.2 | 13.6 | 4.8 | 1.6 | -- | -- | -- |
| Oak-hickory | 19.3 | -- | -- | 1.5 | 0.4 | 4.6 | 6.6 | 6.2 | -- | -- |
| Elm-ash-soft maple | 191.8 | -- | 1.5 | 25.2 | 54.0 | 57.7 | 39.6 | 10.8 | 3.0 | -- |
| Maple-birch | 1,160.3 | -- | 12.3 | 32.1 | 136.9 | 319.2 | 428.7 | 186.6 | 38.1 | 6.4 |
| Aspen | 671.4 | -- | -- | 25.9 | 77.2 | 157.9 | 204.3 | 160.8 | 40.3 | 5.0 |
| Paper birch | 110.5 | -- | -- | 6.3 | 13.8 | 47.6 | 36.6 | 4.7 | 1.5 | -- |
| Exotic | 1.2 | -- | -- | -- | -- | -- | 1.2 | -- | -- | -- |
| Nonstocked | 40.2 | 1.7 | 0.7 | 3.2 | 13.6 | 14.3 | 3.6 | 3.1 | -- | -- |
| All types | 3,801.6 | 46.2 | 350.6 | 495.3 | 661.7 | 903.8 | 850.6 | 394.3 | 86.2 | 12.9 |
| WESTERN UPPER PENINSULA | | | | | | | | | | |
| Jack pine | 88.3 | -- | -- | 1.7 | 5.9 | 10.2 | 45.0 | 15.2 | 10.3 | -- |
| Red pine | 57.6 | -- | -- | -- | 19.3 | 13.6 | 6.8 | 17.9 | -- | -- |
| White pine | 48.7 | -- | -- | -- | 8.1 | 29.3 | 9.7 | 1.6 | -- | -- |
| Balsam fir | 366.6 | 1.4 | 6.5 | 44.8 | 92.0 | 146.4 | 57.0 | 5.0 | 11.9 | 1.6 |
| White spruce | 40.6 | -- | -- | 3.3 | 9.8 | 13.0 | 3.3 | 11.2 | -- | -- |
| Black spruce | 209.5 | -- | 35.6 | 88.5 | 55.5 | 25.1 | 4.4 | 0.4 | -- | -- |
| Northern white-cedar | 210.2 | 16.3 | 103.8 | 58.3 | 18.2 | 2.7 | 10.9 | -- | -- | -- |
| Tamarack | 36.0 | -- | -- | 12.9 | 14.1 | 5.2 | 3.8 | -- | -- | -- |
| Oak-hickory | 22.6 | -- | -- | 1.7 | 3.2 | 4.7 | 11.4 | 1.6 | -- | -- |
| Elm-ash-soft maple | 169.7 | -- | 3.0 | 39.2 | 41.0 | 35.2 | 35.5 | 14.2 | 1.6 | -- |
| Maple-birch | 2,372.4 | -- | 9.3 | 51.7 | 267.1 | 616.8 | 825.5 | 463.1 | 126.2 | 12.7 |
| Aspen | 733.3 | -- | -- | 5.3 | 31.9 | 127.4 | 217.3 | 232.0 | 101.2 | 18.2 |
| Paper birch | 143.8 | -- | 1.3 | 3.1 | 6.7 | 62.1 | 54.6 | 16.0 | -- | -- |
| Exotic | 1.6 | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- |
| Nonstocked | 28.7 | -- | 2.3 | 2.6 | 2.8 | 17.0 | 2.9 | 1.1 | -- | -- |
| All types | 4,529.6 | 17.7 | 161.8 | 313.1 | 575.6 | 1,110.3 | 1,288.1 | 779.3 | 251.2 | 32.5 |

(Table 17 continued on next page)

(Table 17 continued)

NORTHERN LOWER PENINSULA

| Forest type | All classes | Site-index class (feet) 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 506.7 | -- | -- | 60.8 | 200.7 | 183.5 | 46.4 | 7.8 | 7.5 | -- |
| Red pine | 427.0 | -- | -- | 2.6 | 90.9 | 139.2 | 108.3 | 66.3 | 19.7 | -- |
| White pine | 75.2 | -- | -- | 6.4 | 12.1 | 22.5 | 22.4 | 7.1 | 4.7 | -- |
| Balsam fir | 51.4 | -- | -- | 2.8 | 17.2 | 24.9 | 4.2 | 2.3 | -- | -- |
| White spruce | 21.9 | -- | 4.7 | 4.3 | 2.2 | 2.5 | -- | 5.5 | 2.7 | -- |
| Black spruce | 28.0 | -- | 1.9 | 9.9 | 7.6 | 3.7 | 4.9 | -- | -- | -- |
| Northern white-cedar | 355.5 | 15.4 | 120.4 | 142.6 | 51.1 | 12.3 | 11.4 | 2.3 | -- | -- |
| Tamarack | 30.6 | -- | 8.2 | 8.7 | -- | 8.3 | 3.1 | -- | 2.3 | -- |
| Oak-hickory | 1,068.1 | -- | 2.3 | 49.4 | 271.5 | 339.9 | 244.2 | 119.1 | 29.6 | 12.1 |
| Elm-ash-soft maple | 416.3 | -- | 5.5 | 39.6 | 48.5 | 97.1 | 120.2 | 68.8 | 13.8 | 22.8 |
| Maple-birch | 1,662.4 | -- | -- | 27.5 | 116.6 | 297.5 | 465.8 | 477.0 | 210.7 | 67.3 |
| Aspen | 1,817.5 | -- | 2.7 | 24.6 | 104.9 | 273.0 | 507.8 | 532.9 | 293.9 | 77.7 |
| Paper birch | 113.9 | -- | 0.1 | 9.8 | 18.0 | 34.1 | 33.7 | 13.3 | 4.9 | -- |
| Exotic | 57.2 | -- | -- | -- | 12.5 | 13.0 | 21.0 | 9.6 | -- | 1.1 |
| Nonstocked | 63.2 | -- | 1.6 | 11.3 | 23.4 | 12.7 | 6.6 | 7.6 | -- | -- |
| All types | 6,694.9 | 15.4 | 147.4 | 400.3 | 977.2 | 1,464.2 | 1,600.0 | 1,319.6 | 589.8 | 181.0 |

SOUTHERN LOWER PENINSULA

| Forest type | All classes | Site-index class (feet) 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
|---|---|---|---|---|---|---|---|---|---|---|
| Jack pine | 12.6 | -- | -- | 0.2 | 0.1 | -- | 12.3 | -- | -- | -- |
| Red pine | 31.5 | -- | -- | -- | 2.7 | 2.9 | 0.2 | 6.7 | 19.0 | -- |
| White pine | 21.5 | -- | -- | -- | -- | 11.1 | -- | 8.3 | 2.1 | -- |
| Balsam fir | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 7.5 | -- | -- | -- | -- | 7.5 | -- | -- | -- | -- |
| Black spruce | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 13.0 | -- | 6.6 | 3.3 | -- | 0.2 | 2.9 | -- | -- | -- |
| Tamarack | 4.4 | -- | 4.4 | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 663.6 | -- | -- | 13.1 | 35.3 | 114.3 | 194.7 | 176.7 | 101.1 | 28.4 |
| Elm-ash-soft maple | 548.6 | -- | -- | 24.1 | 18.5 | 71.2 | 138.5 | 98.0 | 101.9 | 96.4 |
| Maple-birch | 903.3 | -- | -- | 9.2 | 42.2 | 86.7 | 206.0 | 277.6 | 189.0 | 92.6 |
| Aspen | 184.4 | -- | -- | -- | -- | 33.8 | 40.5 | 28.4 | 77.5 | 4.2 |
| Paper birch | 6.6 | -- | -- | -- | -- | 3.3 | -- | 3.3 | -- | -- |
| EXotic | 26.3 | -- | -- | 4.2 | 10.0 | 6.0 | 6.1 | -- | -- | -- |
| Nonstocked | 40.1 | -- | -- | -- | 20.2 | 10.1 | 1.8 | 3.8 | 4.2 | -- |
| All types | 2,463.4 | -- | 11.0 | 54.1 | 129.0 | 347.1 | 603.0 | 602.8 | 494.8 | 221.6 |

Table 18.--Area of commercial forest land by forest type, stand-size class, and basal-area class, Michigan, 1980

(In thousand acres)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Jack pine | | | | | | | | | | | | | | |
| Sawtimber | 163.8 | -- | -- | 4.2 | 10.8 | 23.1 | 22.8 | 32.4 | 24.4 | 15.5 | 16.6 | 14.0 | -- | -- | -- |
| Poletimber | 454.9 | -- | 4.4 | 20.2 | 18.3 | 72.0 | 29.9 | 46.0 | 55.2 | 34.9 | 65.4 | 56.8 | 50.2 | -- | 1.6 |
| Sapling & seedling | 218.0 | 27.4 | 16.9 | 18.7 | 38.1 | 35.4 | 24.0 | 21.5 | 18.7 | 4.9 | 4.1 | -- | 8.3 | -- | -- |
| All stands | 836.7 | 27.4 | 21.3 | 43.1 | 67.2 | 130.5 | 76.7 | 99.9 | 98.3 | 55.3 | 86.1 | 70.8 | 58.5 | -- | 1.6 |
| Red pine | | | | | | | | | | | | | | |
| Sawtimber | 140.0 | -- | 1.9 | -- | 7.8 | 7.9 | 1.4 | 10.5 | 17.7 | 9.1 | 9.0 | 19.4 | 34.5 | 15.8 | 5.0 |
| Poletimber | 329.2 | -- | -- | -- | 2.2 | 7.5 | 14.3 | 17.0 | 49.7 | 19.5 | 17.8 | 54.9 | 54.4 | 59.5 | 32.4 |
| Sapling & seedling | 186.7 | 37.0 | 9.6 | 23.6 | 17.5 | 6.3 | 46.7 | 18.3 | 14.0 | 7.8 | -- | 3.5 | 2.4 | -- | -- |
| All stands | 655.9 | 37.0 | 11.5 | 23.6 | 27.5 | 21.7 | 62.4 | 45.8 | 81.4 | 36.4 | 26.8 | 77.8 | 91.3 | 75.3 | 37.4 |
| White pine | | | | | | | | | | | | | | |
| Sawtimber | 147.5 | -- | -- | 1.4 | 7.4 | 5.5 | 3.0 | 8.9 | 20.2 | 11.6 | 18.6 | 32.2 | 8.2 | 30.5 | -- |
| Poletimber | 40.5 | -- | -- | -- | -- | 4.8 | 3.7 | 6.9 | 5.9 | 4.0 | 1.7 | 10.2 | 3.3 | -- | -- |
| Sapling & seedling | 26.1 | 1.5 | 3.4 | 7.1 | 1.7 | 4.4 | 2.3 | 5.7 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 214.1 | 1.5 | 3.4 | 8.5 | 9.1 | 14.7 | 9.0 | 21.5 | 26.1 | 15.6 | 20.3 | 42.4 | 11.5 | 30.5 | -- |
| Balsam fir | | | | | | | | | | | | | | |
| Sawtimber | 143.0 | -- | -- | -- | -- | -- | 11.3 | 1.6 | -- | 12.7 | 22.6 | 45.8 | 40.1 | 2.8 | 6.1 |
| Poletimber | 315.9 | -- | -- | 1.7 | 2.9 | 10.4 | 3.8 | 33.3 | 35.5 | 19.0 | 37.6 | 73.1 | 53.3 | 32.7 | 12.6 |
| Sapling & seedling | 176.5 | 2.8 | 25.0 | 7.9 | 22.4 | 21.2 | 13.8 | 28.7 | 15.5 | 12.0 | 16.2 | 4.9 | 4.7 | 1.4 | -- |
| All stands | 635.4 | 2.8 | 25.0 | 9.6 | 25.3 | 31.6 | 28.9 | 63.6 | 51.0 | 43.7 | 76.4 | 123.8 | 98.1 | 36.9 | 18.7 |
| White spruce | | | | | | | | | | | | | | |
| Sawtimber | 28.6 | -- | -- | -- | 1.5 | 1.7 | -- | 1.7 | 2.0 | 1.5 | 2.5 | 7.0 | 4.8 | 2.9 | 3.0 |
| Poletimber | 44.7 | -- | -- | -- | -- | 1.7 | -- | 2.6 | 3.4 | 8.1 | 4.8 | 4.0 | 16.9 | 1.7 | 1.5 |
| Sapling & seedling | 26.8 | 2.3 | 7.9 | 1.6 | 3.8 | 1.7 | 1.6 | 2.7 | 2.5 | -- | -- | 2.7 | -- | -- | -- |
| All stands | 100.1 | 2.3 | 7.9 | 1.6 | 5.3 | 5.1 | 1.6 | 7.0 | 7.9 | 9.6 | 7.3 | 13.7 | 21.7 | 4.6 | 4.5 |
| Black spruce | | | | | | | | | | | | | | |
| Sawtimber | 13.7 | -- | -- | -- | -- | -- | 1.8 | -- | 3.8 | 1.5 | -- | 1.7 | 4.9 | -- | -- |
| Poletimber | 261.2 | 1.5 | -- | 1.6 | 43.7 | 7.7 | 15.3 | 13.6 | 9.3 | 13.1 | 30.4 | 78.8 | 27.3 | 10.3 | 8.6 |
| Sapling & seedling | 245.7 | 16.4 | 43.9 | 17.9 | 28.2 | 39.2 | 15.7 | 32.6 | 14.0 | 6.4 | 15.6 | 10.6 | 5.2 | -- | -- |
| All stands | 520.6 | 17.9 | 43.9 | 19.5 | 71.9 | 46.9 | 32.8 | 46.2 | 27.1 | 21.0 | 46.0 | 91.1 | 37.4 | 10.3 | 8.6 |
| Northern white-cedar | | | | | | | | | | | | | | |
| Sawtimber | 305.8 | -- | -- | -- | 4.8 | 3.2 | 4.4 | 9.8 | 10.3 | -- | 18.0 | 70.7 | 58.0 | 64.6 | 62.0 |
| Poletimber | 640.6 | -- | -- | -- | 5.5 | 1.8 | 5.6 | 13.3 | 19.2 | 19.4 | 32.3 | 80.2 | 167.9 | 138.5 | 156.9 |
| Sapling & seedling | 227.2 | 9.9 | 13.3 | 5.0 | 9.3 | 14.9 | 7.2 | 21.5 | 26.0 | 11.9 | 16.3 | 25.9 | 38.4 | 26.0 | 1.6 |
| All stands | 1,173.6 | 9.9 | 13.3 | 5.0 | 19.6 | 19.9 | 17.2 | 44.6 | 55.5 | 31.3 | 66.6 | 176.8 | 264.3 | 229.1 | 220.5 |

(Table 18 continued on next page)

(Table 18 continued)

| Forest type and stand-size class | All classes | Basal area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Tamarack | | | | | | | | | | | | | | |
| Sawtimber | 12.6 | -- | -- | 2.7 | 2.3 | 2.4 | -- | -- | 3.9 | -- | -- | -- | 1.3 | -- | -- |
| Poletimber | 35.5 | -- | -- | -- | 4.3 | 3.6 | 3.4 | 10.1 | 3.2 | 5.6 | 3.3 | 2.0 | -- | -- | -- |
| Sapling & seedling | 66.7 | 3.0 | 3.8 | 14.6 | 15.0 | 3.2 | 4.5 | 4.2 | 8.8 | 6.4 | 1.6 | -- | 1.6 | -- | -- |
| All stands | 114.8 | 3.0 | 3.8 | 17.3 | 21.6 | 9.2 | 7.9 | 14.3 | 15.9 | 12.0 | 4.9 | 2.0 | 2.9 | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 684.0 | 1.7 | -- | 7.5 | 14.3 | 34.8 | 60.1 | 71.0 | 94.2 | 83.5 | 72.0 | 127.9 | 99.0 | 18.0 | -- |
| Poletimber | 782.2 | -- | 1.1 | -- | 4.3 | 46.6 | 100.8 | 103.5 | 118.4 | 101.1 | 103.9 | 129.5 | 56.1 | 10.7 | 6.2 |
| Sapling & seedling | 307.4 | 38.1 | 47.6 | 31.1 | 58.1 | 65.2 | 29.8 | 30.0 | 1.2 | 1.2 | 3.5 | 1.6 | -- | -- | -- |
| All stands | 1,773.6 | 39.8 | 48.7 | 38.6 | 76.7 | 146.6 | 190.7 | 204.5 | 213.8 | 185.8 | 179.4 | 259.0 | 155.1 | 28.7 | 6.2 |
| Elm-ash-soft maple | | | | | | | | | | | | | | | |
| Sawtimber | 453.5 | -- | -- | 12.0 | 27.3 | 37.2 | 20.3 | 33.0 | 64.5 | 25.6 | 21.0 | 74.6 | 95.3 | 37.0 | 5.7 |
| Poletimber | 471.1 | -- | 7.2 | 14.0 | 27.8 | 45.9 | 13.4 | 46.3 | 64.6 | 20.7 | 86.0 | 54.4 | 55.5 | 31.4 | 3.9 |
| Sapling & seedling | 401.8 | 44.2 | 35.2 | 32.6 | 88.0 | 52.5 | 50.2 | 37.5 | 30.5 | 3.0 | 16.3 | 8.8 | 3.0 | -- | -- |
| All stands | 1,326.4 | 44.2 | 42.4 | 58.6 | 143.1 | 135.6 | 83.9 | 116.8 | 159.6 | 49.3 | 123.3 | 137.8 | 153.8 | 68.4 | 9.6 |
| Maple-birch | | | | | | | | | | | | | | | |
| Sawtimber | 2,479.7 | -- | 4.2 | -- | 18.6 | 55.8 | 45.0 | 132.1 | 217.9 | 168.6 | 351.4 | 534.8 | 668.7 | 219.8 | 62.8 |
| Poletimber | 2,568.2 | -- | 3.6 | 13.5 | 36.4 | 53.2 | 62.6 | 162.1 | 232.2 | 200.5 | 340.7 | 601.1 | 643.0 | 200.5 | 18.8 |
| Sapling & seedling | 1,050.5 | 88.1 | 126.2 | 91.7 | 154.6 | 135.9 | 98.3 | 136.6 | 73.7 | 60.2 | 34.8 | 41.6 | 8.8 | -- | -- |
| All stands | 6,098.4 | 88.1 | 134.0 | 105.2 | 209.6 | 244.9 | 205.9 | 430.8 | 523.8 | 429.3 | 726.9 | 1,177.5 | 1,320.5 | 420.3 | 81.6 |
| Aspen | | | | | | | | | | | | | | | |
| Sawtimber | 533.8 | -- | 2.6 | 3.8 | 17.6 | 44.6 | 19.4 | 46.8 | 62.7 | 41.8 | 61.3 | 62.3 | 103.8 | 43.2 | 23.9 |
| Poletimber | 1,504.5 | -- | 5.4 | 12.5 | 60.7 | 82.7 | 93.7 | 169.0 | 159.7 | 149.4 | 214.9 | 191.3 | 234.5 | 103.2 | 27.5 |
| Sapling & seedling | 1,368.3 | 157.8 | 164.9 | 177.0 | 210.1 | 237.4 | 114.7 | 132.8 | 58.8 | 23.0 | 50.3 | 26.8 | 14.7 | -- | -- |
| All stands | 3,406.6 | 157.8 | 172.9 | 193.3 | 288.4 | 364.7 | 227.8 | 348.6 | 281.2 | 214.2 | 326.5 | 280.4 | 353.0 | 146.4 | 51.4 |
| Paper birch | | | | | | | | | | | | | | | |
| Sawtimber | 35.2 | -- | -- | -- | 1.5 | -- | 2.2 | 3.1 | -- | 1.6 | 3.9 | 9.5 | 11.8 | -- | 1.6 |
| Poletimber | 269.9 | -- | -- | -- | 2.3 | 11.0 | 16.7 | 17.5 | 24.2 | 11.6 | 43.9 | 41.2 | 80.0 | 18.5 | 3.0 |
| Sapling & seedling | 69.7 | 5.5 | 7.2 | 7.1 | 7.0 | 12.4 | 6.3 | 8.8 | 3.0 | 4.8 | 4.3 | 3.3 | -- | -- | -- |
| All stands | 374.8 | 5.5 | 7.2 | 7.1 | 10.8 | 23.4 | 25.2 | 29.4 | 27.2 | 18.0 | 52.1 | 54.0 | 91.8 | 18.5 | 4.6 |
| Exotic | | | | | | | | | | | | | | | |
| Sawtimber | 4.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 | -- | -- | -- |
| Poletimber | 35.0 | -- | -- | -- | -- | -- | 3.5 | -- | 2.2 | 2.4 | 8.5 | 10.1 | 5.9 | 2.4 | -- |
| Sapling & seedling | 46.5 | 1.1 | 6.0 | 2.4 | 5.2 | 4.3 | -- | 6.8 | 14.6 | -- | 3.5 | -- | 2.6 | -- | -- |
| All stands | 86.3 | 1.1 | 6.0 | 2.4 | 5.2 | 4.3 | 3.5 | 6.8 | 16.8 | 2.4 | 12.0 | 14.9 | 8.5 | 2.4 | -- |
| Nonstocked | 172.2 | 109.6 | 50.2 | 4.0 | 2.6 | 2.7 | 0.4 | 2.2 | 0.5 | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 5,146.0 | 1.7 | 8.7 | 31.6 | 113.9 | 216.2 | 191.7 | 350.9 | 521.6 | 373.0 | 596.9 | 1,004.7 | 1,130.4 | 434.6 | 170.1 |
| Poletimber | 7,753.4 | 1.5 | 21.7 | 63.5 | 208.4 | 348.9 | 366.7 | 641.2 | 782.7 | 609.3 | 991.2 | 1,387.6 | 1,448.3 | 609.4 | 273.0 |
| Sapling & seedling | 4,417.9 | 435.1 | 510.9 | 438.3 | 659.0 | 634.0 | 415.1 | 487.7 | 281.3 | 141.6 | 166.5 | 129.7 | 89.7 | 27.4 | 1.6 |
| Nonstocked | 172.2 | 109.6 | 50.2 | 4.0 | 2.6 | 2.7 | 0.4 | 2.2 | 0.5 | -- | -- | -- | -- | -- | -- |
| All stands | 17,489.5 | 547.9 | 591.5 | 537.4 | 983.9 | 1,201.8 | 973.9 | 1,482.0 | 1,586.1 | 1,123.9 | 1,754.6 | 2,522.0 | 2,668.4 | 1,071.4 | 444.7 |

Table 19.--Area of commercial forest land by stocking class of growing-stock trees and stand-size class, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | All stands | Stand-size class: Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
|---|---|---|---|---|---|
| Less than 16.7 | 172.2 | -- | -- | -- | 172.2 |
| 16.7 to 60.9 | 2,050.7 | 401.3 | 751.9 | 897.5 | -- |
| 61.0 to 100.9 | 6,602.3 | 1,900.6 | 2,895.2 | 1,806.5 | -- |
| 101.0 to 133.9 | 7,125.0 | 2,382.9 | 3,416.6 | 1,325.5 | -- |
| 134.0+ | 1,539.3 | 461.2 | 689.7 | 388.4 | -- |
| All classes | 17,489.5 | 5,146.0 | 7,753.4 | 4,417.9 | 172.2 |

Table 20.--Area of commercial forest land by stocking class based on selected stand components, Michigan, 1980

(In thousand acres)

| Stocking class (percent) | Stocking classified in terms of: All live trees | Growing-stock trees | Desirable trees | Acceptable trees | Rough and rotten trees |
|---|---|---|---|---|---|
| 0-10 | 38.9 | 94.6 | 17,069.4 | 94.6 | 10,172.9 |
| 11-20 | 76.2 | 208.7 | 313.3 | 211.4 | 4,373.5 |
| 21-30 | 206.2 | 248.1 | 75.1 | 253.5 | 1,841.5 |
| 31-40 | 188.5 | 345.0 | 21.8 | 365.3 | 680.3 |
| 41-50 | 384.5 | 592.8 | 3.4 | 603.6 | 270.4 |
| 51-60 | 485.8 | 734.1 | 3.8 | 777.4 | 94.6 |
| 61-70 | 787.8 | 1,072.4 | -- | 1,097.7 | 31.5 |
| 71-80 | 777.1 | 1,342.8 | 2.7 | 1,410.2 | 9.7 |
| 81-90 | 1,430.7 | 1,942.7 | -- | 1,994.3 | 4.8 |
| 91-100 | 1,772.6 | 2,244.3 | -- | 2,400.9 | 1.5 |
| 101-110 | 2,091.8 | 2,489.8 | -- | 2,490.9 | 1.8 |
| 111-120 | 2,542.6 | 2,279.7 | -- | 2,220.8 | 1.2 |
| 121-130 | 2,534.4 | 1,894.8 | -- | 1,823.7 | 3.1 |
| 131-140 | 2,070.4 | 1,230.0 | -- | 1,064.6 | 2.7 |
| 141-150 | 1,434.1 | 576.4 | -- | 511.9 | -- |
| 151-160 | 643.3 | 193.3 | -- | 168.7 | -- |
| 161+ | 24.6 | -- | -- | -- | -- |
| Total | 17,489.5 | 17,489.5 | 17,489.5 | 17,489.5 | 17,489.5 |

Table 21.--Area of noncommercial forest land by ownership class, Michigan, 1980

(In thousand acres)

| Ownership class | All areas | Productive-reserved areas | Unproductive areas |
|---|---|---|---|
| National Forest | 137.4 | 65.8[1] | 71.6 |
| Bureau of Land Management | -- | -- | -- |
| Indian | -- | -- | -- |
| Miscellaneous federal | 184.0 | 180.5 | 3.5 |
| State | 382.1 | 321.4 | 60.7 |
| County and municipal | 15.3 | 13.7 | 1.6 |
| Forest industry | 24.7 | -- | 24.7 |
| Farmer | 42.9 | 17.7 | 25.2 |
| Misc. private-corp. | 35.1 | 10.1 | 25.0 |
| Misc. private-indiv. | 57.8 | 12.9 | 44.9 |
| Total | 879.3 | 622.1 | 257.2 |

[1] Includes 42.6 thousand acres of productive-deferred areas.

## Table 22.--Area of noncommercial forest land by forest type, Michigan, 1980

(In thousand acres)

| Forest type | All areas | Productive-reserved areas[1] | Unproductive areas |
|---|---|---|---|
| Jack pine | 23.3 | 16.2 | 7.1 |
| Red pine | 13.5 | 11.6 | 1.9 |
| White pine | 4.8 | 3.2 | 1.6 |
| Balsam fir | 76.9 | 71.6 | 5.3 |
| White spruce | 13.2 | 10.7 | 2.5 |
| Black spruce | 78.0 | 18.2 | 59.8 |
| Northern white-cedar | 73.7 | 6.4 | 67.3 |
| Tamarack | 18.9 | 0.1 | 18.8 |
| Oak-hickory | 80.8 | 74.8 | 6.0 |
| Elm-ash-soft maple | 78.4 | 52.8 | 25.6 |
| Maple-birch | 191.2 | 185.4 | 5.8 |
| Aspen | 133.4 | 125.7 | 7.7 |
| Paper birch | 15.4 | 8.2 | 7.2 |
| Exotic | 33.8 | 33.8 | -- |
| Nonstocked | 44.0 | 3.4 | 40.6 |
| All types | 879.3 | 622.1 | 257.2 |

[1] Includes 42.6 thousand acres of productive-deferred areas.

## Table 23.--Area of nonforest land with trees by forest type and land use, Michigan 1980

(In thousand acres)

| Forest type | All uses | Land use | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cropland | Improved pasture | Wooded strips | Idle farmland | Marsh | Wind-breaks | Urban and other windbreaks | Wooded pasture |
| Jack pine | 12.4 | 4.7 | 4.1 | -- | -- | 1.2 | 2.4 | -- | -- |
| Red pine | 15.5 | -- | 2.3 | 13.2 | -- | -- | -- | -- | -- |
| White pine | 2.2 | -- | -- | -- | -- | 2.2 | -- | -- | -- |
| Balsam fir | 5.9 | 1.7 | -- | -- | -- | 4.2 | -- | -- | -- |
| White spruce | 4.5 | -- | 2.3 | -- | -- | -- | -- | -- | 2.2 |
| Black spruce | 23.6 | -- | -- | 1.8 | -- | 21.8 | -- | -- | -- |
| Northern white-cedar | 22.4 | -- | -- | 1.9 | -- | 20.5 | -- | -- | -- |
| Tamarack | 5.2 | -- | -- | -- | -- | 5.2 | -- | -- | -- |
| Oak-hickory | 97.2 | 31.2 | 22.8 | 41.2 | 2.0 | -- | -- | -- | -- |
| Elm-ash-soft maple | 243.5 | 18.5 | 2.4 | 95.9 | 6.7 | 100.6 | 12.1 | -- | 7.3 |
| Maple-birch | 139.7 | 25.3 | 25.2 | 60.5 | -- | 9.2 | 17.3 | -- | 2.2 |
| Aspen | 128.0 | 15.4 | 18.6 | 26.8 | 4.1 | 55.7 | 5.7 | -- | 1.7 |
| Paper birch | 19.2 | -- | 4.5 | -- | -- | 14.7 | -- | -- | -- |
| Exotic | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | 719.3 | 96.8 | 82.2 | 241.3 | 12.8 | 235.3 | 37.5 | -- | 13.4 |

Table 24.--Area of plantations by forest type and stand-age class, Michigan, 1980

(In thousand acres)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 |
| Jack pine | 225.2 | 29.2 | 38.2 | 15.7 | 55.6 | 71.9 | 9.3 | 2.7 | 2.6 | -- | -- |
| Red pine | 507.6 | 44.6 | 120.4 | 170.2 | 110.2 | 51.0 | 2.1 | 6.0 | -- | 3.1 | -- |
| White pine | 30.0 | -- | -- | 14.7 | 1.7 | 5.4 | -- | 4.0 | 4.2 | -- | -- |
| Balsam fir | 11.6 | 1.3 | 10.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| White spruce | 31.5 | -- | 11.3 | 1.2 | 17.0 | -- | -- | -- | 2.0 | -- | -- |
| Black spruce | 3.6 | -- | 0.8 | -- | 2.8 | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 2.3 | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 94.5 | 20.6 | 6.1 | 4.7 | 6.7 | 9.6 | 17.1 | 10.2 | 8.1 | 10.1 | 1.3 |
| Elm-ash-soft maple | 6.8 | -- | -- | 3.4 | -- | -- | -- | 3.4 | -- | -- | -- |
| Maple-birch | 127.4 | 25.7 | 26.5 | 11.2 | 13.6 | 15.1 | 14.5 | 10.5 | 7.9 | -- | 2.4 |
| Aspen | 71.1 | 21.6 | 19.3 | 5.0 | 6.0 | 7.2 | 5.6 | -- | 4.9 | -- | 1.5 |
| Paper birch | 5.0 | -- | -- | -- | 1.8 | -- | -- | 3.2 | -- | -- | -- |
| Exotic | 96.2 | 21.9 | 29.1 | 28.7 | 9.4 | -- | 7.1 | -- | -- | -- | -- |
| All types | 1,212.8 | 164.9 | 264.3 | 254.8 | 224.8 | 160.2 | 55.7 | 40.0 | 29.7 | 13.2 | 5.2 |

Table 25.--Area of plantations by forest type and site-index class, Michigan, 1980

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| Jack pine | 225.2 | 9.6 | 36.1 | 79.3 | 58.6 | 31.8 | 8.2 | 1.6 | -- |
| Red pine | 507.6 | -- | 2.6 | 122.4 | 153.9 | 136.7 | 73.0 | 19.0 | -- |
| White pine | 30.0 | -- | 1.7 | 2.6 | 15.1 | 1.7 | 6.8 | 2.1 | -- |
| Balsam fir | 11.6 | -- | -- | 1.6 | 1.3 | -- | -- | 8.7 | -- |
| White spruce | 31.5 | -- | 2.3 | 1.3 | 11.1 | 1.6 | 12.5 | 2.7 | -- |
| Black spruce | 3.6 | -- | -- | 3.2 | -- | -- | 0.4 | -- | -- |
| Northern white-cedar | 2.3 | -- | -- | -- | -- | -- | 2.3 | -- | -- |
| Oak-hickory | 94.5 | -- | 4.1 | 39.7 | 23.6 | 4.1 | 14.7 | 8.3 | -- |
| Elm-ash-soft maple | 6.8 | -- | -- | -- | -- | -- | -- | -- | 6.8 |
| Maple-birch | 127.4 | -- | 1.5 | 20.0 | 30.5 | 32.5 | 32.6 | 10.3 | -- |
| Aspen | 71.1 | -- | 1.4 | 5.5 | 23.3 | 25.3 | 8.0 | 7.6 | -- |
| Paper birch | 5.0 | -- | -- | -- | 3.2 | 1.8 | — | -- | -- |
| Exotic | 96.2 | -- | 8.5 | 28.1 | 23.0 | 28.4 | 7.1 | -- | 1.1 |
| All types | 1,212.8 | 9.6 | 58.2 | 303.7 | 343.6 | 263.9 | 165.6 | 60.3 | 7.9 |

Table 26.--Number of growing-stock trees by species group and forest type in plantations, Michigan, 1980

(In thousand trees)

| | | Forest type | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species group | All types | Jack pine | Red pine | White pine | Balsam fir | White spruce | Black spruce | Northern white-cedar | Oak-hickory | Elm-ash soft maple | Maple-birch | Aspen | Paper birch | Exotic |
| SOFTWOODS | | | | | | | | | | | | | | |
| White pine | 5,357 | 219 | 1,197 | 2,481 | -- | -- | -- | -- | 111 | -- | 856 | 124 | 51 | 318 |
| Red pine | 112,940 | 5,014 | 99,094 | 190 | 23 | 94 | 53 | -- | 3,289 | 105 | 2,096 | 1,287 | 38 | 1,657 |
| Jack pine | 45,941 | 32,262 | 12,028 | -- | -- | -- | -- | -- | 510 | -- | 148 | 896 | 7 | 90 |
| White spruce | 3,795 | -- | 289 | -- | 31 | 2,873 | -- | -- | 124 | -- | 31 | 363 | 84 | -- |
| Black spruce | 721 | -- | 149 | 210 | 26 | -- | 336 | -- | -- | -- | -- | -- | -- | -- |
| Balsam fir | 760 | -- | 476 | -- | 205 | 79 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hemlock | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- |
| Tamarack | 53 | -- | 21 | -- | -- | 32 | -- | -- | -- | -- | -- | -- | -- | -- |
| Northern white-cedar | 317 | -- | 200 | -- | -- | -- | -- | -- | -- | -- | 101 | 16 | -- | -- |
| Other softwoods | 15,101 | -- | 850 | 1,380 | -- | 557 | -- | 339 | 155 | 103 | 1,969 | -- | -- | 9,748 |
| Total | 184,987 | 37,495 | 114,304 | 4,261 | 285 | 3,635 | 389 | 339 | 4,189 | 208 | 5,203 | 2,686 | 180 | 11,813 |
| HARDWOODS | | | | | | | | | | | | | | |
| Select white oaks | 2,351 | 71 | 947 | -- | -- | -- | -- | -- | 1,249 | -- | 18 | 55 | 11 | -- |
| Select red oaks | 3,647 | 553 | 385 | 86 | -- | -- | -- | -- | 2,207 | -- | 226 | 82 | -- | 108 |
| Other red oaks | 4,221 | 619 | 1,002 | -- | -- | -- | -- | -- | 2,191 | -- | 365 | -- | -- | 44 |
| Hickory | 230 | 19 | -- | -- | -- | -- | -- | -- | 181 | -- | 30 | -- | -- | -- |
| Yellow birch | 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 |
| Hard maple | 4,710 | -- | 495 | -- | 80 | 15 | 51 | -- | -- | -- | 4,025 | 5 | -- | 39 |
| Soft maple | 4,399 | 247 | 1,258 | 89 | -- | -- | -- | -- | 420 | 86 | 1,908 | 342 | 21 | 28 |
| Beech | 225 | -- | 23 | -- | -- | -- | -- | -- | -- | -- | 202 | -- | -- | -- |
| Ash | 1,243 | -- | 24 | -- | -- | -- | -- | -- | -- | 389 | 712 | 114 | -- | 4 |
| Balsam poplar | 279 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 | 138 | 30 | 101 |
| Cottonwood | 105 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 105 | -- | -- | -- |
| Bigtooth aspen | 2,504 | 174 | 690 | -- | -- | -- | -- | -- | 261 | -- | 19 | 1,360 | -- | -- |
| Quaking aspen | 8,740 | 661 | 2,443 | 27 | -- | 1,438 | -- | 95 | 78 | -- | 1,006 | 2,831 | 27 | 134 |
| Basswood | 709 | 66 | 63 | 51 | -- | -- | -- | -- | -- | -- | 418 | 3 | -- | 108 |
| Yellow-poplar | 81 | -- | 81 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black walnut | 17 | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Black cherry | 1,568 | 46 | 199 | -- | -- | 166 | -- | -- | 140 | -- | 1,005 | -- | -- | 12 |
| Butternut | 117 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 117 | -- | -- | -- |
| Elm | 719 | -- | -- | -- | -- | -- | -- | -- | 88 | 55 | 562 | 14 | -- | -- |
| Paper birch | 710 | 46 | 204 | -- | -- | -- | -- | -- | -- | -- | 33 | 128 | 299 | -- |
| Other hardwoods | 1,064 | 59 | -- | -- | -- | -- | -- | -- | 58 | 26 | 921 | -- | -- | -- |
| Total | 37,643 | 2,561 | 7,831 | 253 | 80 | 1,619 | 51 | 95 | 6,873 | 556 | 11,682 | 5,072 | 388 | 582 |
| All species | 222,630 | 40,056 | 122,135 | 4,514 | 365 | 5,254 | 440 | 434 | 11,062 | 764 | 16,885 | 7,758 | 568 | 12,395 |

Table 27.--Sampling errors[1] for estimates of commercial forest area smaller than state totals, Michigan, 1980

| Sampling error | Commercial forest area |
|---|---|
| (Percent) | (Thousand acres) |
| 1 | 1,898.8 |
| 2 | 474.7 |
| 3 | 211.0 |
| 4 | 118.7 |
| 5 | 76.0 |
| 10 | 19.0 |
| 15 | 8.4 |
| 20 | 4.7 |
| 25 | 3.0 |
| 50 | 0.8 |
| 100 | 0.2 |

[1] At the 68-percent probability level.

Spencer, John S., Jr.
Michigan's Fourth Forest Inventory: Area. Resour. Bull. NC-68. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1983. 39 p.

The fourth inventory of Michigan's forest resources found 17.5 million acres of commercial forest, down 7 percent from the 18.9 million found in 1966. This bulletin analyzes findings from the inventory and presents detailed tables of forest area.

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KEY WORDS: Forest area, commercial forest area, forest inventory, land use.

☆ U.S. Government Printing Office: 1983-

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Resource Bulletin **NC-69**

# Pulpwood Production in the North-Central Region by County, 1981

James E. Blyth and W. Brad Smith

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# HIGHLIGHTS

## Lake States

Lake States pulpwood production dropped to 5.60 million cords in 1981. Loggers cut record volumes of aspen, red pine, white pine, yellow birch, balsam poplar, and white oak. Production was at a modern-day low for spruce and hemlock. Whole tree chips comprised 8 percent of total production; Michigan remained the leading producer.

A decline of 7 percent in Michigan production was nearly offset by a 3 percent gain in Minnesota and a 1 percent gain in Wisconsin. Pine and spruce harvests in Minnesota were the lowest since World War II.

Another waferboard plant and the first oriented strand board plant began operating in 1981. Annual production capacity at particleboard and structural board plants rose to 520 million square feet.

## Central States

Pulpwood production was 428,000 cords. Exports from the Central States increased, setting another record. Fifty-eight percent of the pulpwood produced was exported.

Pulpwood receipts plunged 12 percent from 1980 to 194,000 cords. Receipts in Illinois were the lowest since this pulpwood series was begun.

Five mills closed in 1980 and two others closed in 1981. Some closed permanently and all produced organic (wood-based) roofing felt. Organic felts have been and are likely to continue losing market share to fiberglass felts.

# CONTENTS

*Page*

Lake States . . . . . 1
  Production . . . . . 1
  Receipts . . . . . 4
  Industry Trends and Analysis . . . . . 5
Central States . . . . . 6
  Production . . . . . 6
  Receipts . . . . . 8
  Industry Trends and Analysis . . . . . 8
Appendix . . . . . 11

# PULPWOOD PRODUCTION IN THE NORTH CENTRAL REGION BY COUNTY, 1981

**James E. Blyth,** *Principal Market Analyst,*
*and* **W. Brad Smith,** *Mensurationist*

This is the 23rd annual report of the pulpwood harvest in Lake States counties and the 22nd annual report of the harvest in the Central States. Pulpwood constitutes more than half the timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri).

Current detailed pulpwood production[1] information is necessary for intelligent planning and decisionmaking in procuring wood, managing forest resources, and developing forest industries. Also, researchers need current pulpwood information to plan projects.

**Since 1979, we have included logs, bolts, and wood residue used in manufacturing particleboard, waferboard, and oriented strand board in this annual series.** Wood used at these plants is identical or nearly identical to wood used at pulpmills.

Because composition board plants primarily use aspen and wood residue, including them does not distort roundwood use trends for other species nor preclude comparing survey results with 1978 and previous years.

Pulpmills, particleboard plants, and waferboard plants using North Central States timber in 1981 reported their pulpwood receipts[2] by species groups and counties of origin. This report presents the results of the survey, analyzes the data where appropriate, compares results with 1980 or earlier years, and discusses trends in pulpwood production and use.

The Lake States and Central States are discussed separately because the timber types in each area are different and less information can be released about the Central States (more detailed data on pulpwood production and receipts in the Central States would reveal the operations of individual mills).

Pulpwood production in Minnesota is completely and accurately shown. However, to prevent disclosure of confidential information about softwood pulpwood use by individual companies, the total quantity of softwood pulpwood imports and exports between Minnesota and Canada are not reported. **Thus, some Minnesota softwood shipped to Canada is shown as remaining and used in Minnesota, and receipts of Canadian softwood in Minnesota are understated.**

## LAKE STATES

### Production

Compared to 1980, pulpwood production fell 1 percent to 5.60 million cords in 1981 (table 1). Nine out of 10 cords were roundwood (including chips from roundwood); the remainder was residue from wood-using plants.[3]

Major species cut were aspen (2,419,000 cords), jack pine (466,000 cords), and balsam fir (309,000 cords). And red pine, white birch, hard maple, and soft maple each provided more than 200,000 cords.

Pulpwood production from hardwood residue climbed to a record for the third straight year. Similarly, for the second year in a row, production from hardwood roundwood reached a record. Aspen harvesting rose 141,000 cords to surpass the peak set in

---

[1] *Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut in a specific county or region, plus the annual wood residue volume produced by sawmills, veneer mills, etc., in a specific State or region that was used to manufacture pulp and composition board.*

[2] *Pulpwood receipts are the volume of wood received by mills in a specific State or region, regardless of the geographic source.*

[3] *Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using plants that is used for pulping. Residue includes slabs, edgings, veneer cores, sawdust, wood flour, and chips manufactured from slabs, edgings, and veneer cores.*

Table 1.-Production and imports of pulpwood, Lake States, 1981

(In standard cords, unpeeled)

| Species and destination | Production by States [1] | | | | Imports | | | |
|---|---|---|---|---|---|---|---|---|
| | Michigan | Minnesota | Wisconsin | Regional total | Other U.S. [2] | Canada | Total imports | Total receipts |
| Roundwood | | | | | | | | |
| Cedar | | | | | | | | |
| Michigan | 11,304 | 0 | 0 | 11,304 | 0 | 0 | 0 | 11,304 |
| Total | 11,304 | 0 | 0 | 11,304 | 0 | 0 | 0 | 11,304 |
| Balsam fir | | | | | | | | |
| Michigan | 65,892 | 0 | 906 | 66,798 | 0 | 0 | 0 | 66,798 |
| Minnesota | 0 | 71,236 | 0 | 71,236 | 0 | 0 | 0 | 71,236 |
| Wisconsin | 29,967 | 1,247 | 103,872 | 135,086 | 0 | 0 | 0 | 135,086 |
| Exported [3] | 7,831 | 28,260 | 0 | 36,091 | 0 | 0 | 0 | 0 |
| Total | 103,690 | 100,743 | 104,778 | 309,211 | 0 | 0 | 0 | 273,120 |
| Hemlock | | | | | | | | |
| Michigan | 35,732 | 0 | 1,152 | 36,884 | 0 | 0 | 0 | 36,884 |
| Wisconsin | 3,093 | 0 | 27,780 | 30,873 | 0 | 0 | 0 | 30,873 |
| Total | 38,825 | 0 | 28,932 | 67,757 | 0 | 0 | 0 | 67,757 |
| Jack pine | | | | | | | | |
| Michigan | 98,717 | 0 | 299 | 99,016 | 0 | 0 | 0 | 99,016 |
| Minnesota | 0 | 86,418 | 748 | 87,166 | 0 | 177 | 177 | 87,343 |
| Wisconsin | 38,880 | 18,834 | 214,949 | 272,663 | 20,312 [4] | 0 | 20,312 [4] | 292,975 [5] |
| Exported [3] | 0 | 6,195 | 1,120 | 7,315 | 0 | 0 | 0 | 0 |
| Total | 137,597 | 111,447 | 217,116 | 466,160 | 20,312 | 177 | 20,489 | 479,334 |
| Red pine | | | | | | | | |
| Michigan | 67,880 | 0 | 2,400 | 70,280 | 190 | 0 | 190 | 70,470 |
| Minnesota | 0 | 16,489 | 835 | 17,324 | 0 | 0 | 0 | 17,324 |
| Wisconsin | 9,223 | 7,886 | 177,643 | 194,752 | 0 | 477 | 477 | 195,229 |
| Exported [3] | 1,928 | 0 | 0 | 1,928 | 0 | 0 | 0 | 0 |
| Total | 79,031 | 24,375 | 180,878 | 284,284 | 190 | 477 | 667 | 283,023 |
| White pine | | | | | | | | |
| Michigan | 17,901 | 0 | 262 | 18,163 | 0 | 0 | 0 | 18,163 |
| Minnesota | 0 | 10,928 | 83 | 11,011 | 0 | 0 | 0 | 11,011 |
| Wisconsin | 2,220 | 159 | 21,001 | 23,380 | 0 | 0 | 0 | 23,380 |
| Total | 20,121 | 11,087 | 21,346 | 52,554 | 0 | 0 | 0 | 52,554 |
| Spruce | | | | | | | | |
| Michigan | 22,108 | 0 | 154 | 22,262 | 0 | 0 | 0 | 22,262 |
| Minnesota | 0 | 92,340 | 0 | 92,340 | 0 | 2,964 | 2,964 | 95,304 |
| Wisconsin | 15,269 | 25,090 | 27,184 | 67,543 | 0 | 18,577 | 18,577 | 86,120 |
| Exported [3] | 7,329 | 9,988 | 0 | 17,317 | 0 | 0 | 0 | 0 |
| Total | 44,706 | 127,418 | 27,338 | 199,462 | 0 | 21,541 | 21,541 | 203,686 |
| Tamarack | | | | | | | | |
| Michigan | 4,332 | 0 | 50 | 4,382 | 0 | 0 | 0 | 4,382 |
| Minnesota | 0 | 5,181 | 0 | 5,181 | 0 | 0 | 0 | 5,181 |
| Wisconsin | 1,388 | 24,772 | 4,930 | 31,090 | 0 | 82 | 82 | 31,172 |
| Total | 5,720 | 29,953 | 4,980 | 40,653 | 0 | 82 | 82 | 40,735 |
| Ash | | | | | | | | |
| Michigan | 9,559 | 0 | 0 | 9,559 | 0 | 0 | 0 | 9,559 |
| Wisconsin | 5,124 | 220 | 37,497 | 42,841 | 0 | 0 | 0 | 42,841 |
| Exported [3] | 0 | 0 | 80 | 80 | 0 | 0 | 0 | 0 |
| Total | 14,683 | 220 | 37,577 | 52,480 | 0 | 0 | 0 | 52,400 |
| Aspen | | | | | | | | |
| Michigan | 485,709 | 0 | 254 | 485,963 | 0 | 0 | 0 | 485,963 |
| Minnesota | 0 | 693,374 | 31,458 | 724,832 | 0 | 0 | 0 | 724,832 |
| Wisconsin | 166,587 | 82,126 | 933,067 | 1,181,780 | 0 | 0 | 0 | 1,181,780 |
| Exported [3] | 0 | 25,829 | 370 | 26,199 | 0 | 0 | 0 | 0 |
| Total | 652,296 | 801,329 | 965,149 | 2,418,774 | 0 | 0 | 0 | 2,392,575 |
| Balsam poplar | | | | | | | | |
| Michigan | 30,299 | 0 | 0 | 30,299 | 0 | 0 | 0 | 30,299 |
| Minnesota | 0 | 51,100 | 624 | 51,724 | 0 | 0 | 0 | 51,724 |
| Exported [3] | 0 | 580 | 0 | 580 | 0 | 0 | 0 | 0 |
| Total | 30,299 | 51,680 | 624 | 82,603 | 0 | 0 | 0 | 82,023 |
| Basswood | | | | | | | | |
| Michigan | 18,828 | 0 | 34 | 18,862 | 0 | 0 | 0 | 18,862 |
| Minnesota | 0 | 229 | 0 | 229 | 0 | 0 | 0 | 229 |
| Wisconsin | 729 | 2 | 15,581 | 16,312 | 0 | 0 | 0 | 16,312 |
| Exported [3] | 0 | 0 | 149 | 149 | 0 | 0 | 0 | 0 |
| Total | 19,557 | 231 | 15,764 | 35,552 | 0 | 0 | 0 | 35,403 |
| Beech | | | | | | | | |
| Michigan | 10,719 | 0 | 24 | 10,743 | 0 | 0 | 0 | 10,743 |
| Wisconsin | 1,790 | 0 | 22 | 1,812 | 0 | 0 | 0 | 1,812 |
| Total | 12,509 | 0 | 46 | 12,555 | 0 | 0 | 0 | 12,555 |
| White birch | | | | | | | | |
| Michigan | 71,811 | 0 | 229 | 72,040 | 0 | 0 | 0 | 72,040 |
| Minnesota | 0 | 609 | 0 | 609 | 0 | 0 | 0 | 609 |
| Wisconsin | 8,308 | 10,384 | 130,310 | 149,002 | 0 | 0 | 0 | 149,002 |
| Exported [3] | 0 | 138 | 122 | 260 | 0 | 0 | 0 | 0 |
| Total | 80,119 | 11,131 | 130,661 | 221,911 | 0 | 0 | 0 | 221,651 |
| Yellow birch | | | | | | | | |
| Michigan | 13,062 | 0 | 0 | 13,062 | 0 | 0 | 0 | 13,062 |
| Wisconsin | 12,085 | 0 | 28,182 | 40,267 | 0 | 0 | 0 | 40,267 |
| Total | 25,147 | 0 | 28,182 | 53,329 | 0 | 0 | 0 | 53,329 |
| Cottonwood | | | | | | | | |
| Michigan | 391 | 0 | 0 | 391 | 0 | 0 | 0 | 391 |
| Exported [3] | 0 | 0 | 26 | 26 | 0 | 0 | 0 | 0 |
| Total | 391 | 0 | 26 | 417 | 0 | 0 | 0 | 391 |
| Elm | | | | | | | | |
| Michigan | 20,132 | 0 | 21 | 20,153 | 0 | 0 | 0 | 20,153 |
| Wisconsin | 16,175 | 35 | 70,266 | 86,476 | 0 | 0 | 0 | 86,476 |
| Exported [3] | 0 | 0 | 451 | 451 | 0 | 0 | 0 | 0 |
| Total | 36,307 | 35 | 70,738 | 107,080 | 0 | 0 | 0 | 106,629 |

(Table 1 continued on next page)

(Table 1 continued)

| Species and destination | Production by States 1/ Michigan | Minnesota | Wisconsin | Regional total | Imports Other U.S. 2/ | Canada | Total imports | Total receipts |
|---|---|---|---|---|---|---|---|---|
| Roundwood (cont) | | | | | | | | |
| Hickory | | | | | | | | |
| Wisconsin | 0 | 0 | 516 | 516 | 0 | 0 | 0 | 516 |
| Total | 0 | 0 | 516 | 516 | 0 | 0 | 0 | 516 |
| Hard maple | | | | | | | | |
| Michigan | 56,808 | 0 | 24 | 56,832 | 0 | 0 | 0 | 56,832 |
| Wisconsin | 42,267 | 667 | 118,342 | 161,276 | 0 | 0 | 0 | 161,276 |
| Exported 3/ | 0 | 0 | 143 | 143 | 0 | 0 | 0 | 0 |
| Total | 99,075 | 667 | 118,509 | 218,251 | 0 | 0 | 0 | 218,108 |
| Soft maple | | | | | | | | |
| Michigan | 120,971 | 0 | 114 | 121,085 | 0 | 0 | 0 | 121,085 |
| Wisconsin | 18,290 | 14 | 62,900 | 81,204 | 0 | 0 | 0 | 81,204 |
| Exported 3/ | 0 | 0 | 447 | 447 | 0 | 0 | 0 | 0 |
| Total | 139,261 | 14 | 63,461 | 202,736 | 0 | 0 | 0 | 202,289 |
| Red oak | | | | | | | | |
| Michigan | 86,899 | 0 | 20 | 86,919 | 0 | 0 | 0 | 86,919 |
| Wisconsin | 3,065 | 20 | 59,720 | 62,805 | 0 | 0 | 0 | 62,805 |
| Exported 3/ | 0 | 0 | 1,083 | 1,083 | 0 | 0 | 0 | 0 |
| Total | 89,964 | 20 | 60,823 | 150,807 | 0 | 0 | 0 | 149,724 |
| White oak | | | | | | | | |
| Michigan | 22,588 | 0 | 0 | 22,588 | 0 | 0 | 0 | 22,588 |
| Wisconsin | 791 | 8 | 16,579 | 17,378 | 0 | 0 | 0 | 17,378 |
| Exported 3/ | 0 | 0 | 409 | 409 | 0 | 0 | 0 | 0 |
| Total | 23,379 | 8 | 16,988 | 40,375 | 0 | 0 | 0 | 39,966 |
| Other hardwoods | | | | | | | | |
| Michigan | 5,068 | 0 | 0 | 5,068 | 0 | 0 | 0 | 5,068 |
| Wisconsin | 2,570 | 0 | 3,670 | 6,240 | 0 | 0 | 0 | 6,240 |
| Exported 3/ | 0 | 0 | 36 | 36 | 0 | 0 | 0 | 0 |
| Total | 7,638 | 0 | 3,706 | 11,344 | 0 | 0 | 0 | 11,308 |
| Total roundwood | | | | | | | | |
| Michigan | 1,276,710 | 0 | 5,943 | 1,282,653 | 190 | 0 | 190 | 1,282,843 |
| Minnesota | 0 | 1,027,904 | 33,748 | 1,061,652 | 0 | 3,141 | 3,141 | 1,064,793 |
| Wisconsin | 377,821 | 171,464 | 2,054,011 | 2,603,296 | 20,312 | 19,136 | 39,448 | 2,642,744 |
| Exported 3/ | 17,088 | 70,990 | 4,436 | 92,514 | 0 | 0 | 0 | 0 |
| Total | 1,671,619 | 1,270,358 | 2,098,138 | 5,040,115 | 20,502 | 22,277 | 42,779 | 4,990,380 |
| Residue,softwood | | | | | | | | |
| Michigan | 9,711 | 0 | 30 | 9,741 | 0 | 4,032 | 4,032 | 13,773 |
| Minnesota | 0 | 34,223 | 0 | 34,223 | 78 | 2,627 | 2,705 | 36,928 |
| Wisconsin | 4,860 | 2,426 | 46,609 | 53,895 | 142,701 | 55,798 | 198,499 | 252,394 |
| Exported 3/ | 0 | 2,010 | 0 | 2,010 | 0 | 0 | 0 | 0 |
| Total | 14,571 | 38,659 | 46,639 | 99,869 | 142,779 | 62,457 | 205,236 | 303,095 |
| Residue,hardwoods | | | | | | | | |
| Michigan | 115,175 | 0 | 20,135 | 135,310 | 16,020 | 0 | 16,020 | 151,330 |
| Minnesota | 0 | 56,589 | 0 | 56,589 | 0 | 5,671 | 5,671 | 62,260 |
| Wisconsin | 36,283 | 2,897 | 219,263 | 258,443 | 732 | 0 | 732 | 259,175 |
| Exported 3/ | 10 | 2,011 | 4,578 | 6,599 | 0 | 0 | 0 | 0 |
| Total | 151,468 | 61,497 | 243,976 | 456,941 | 16,752 | 5,671 | 22,423 | 472,765 |
| All wood material | | | | | | | | |
| Michigan | 1,401,596 | 0 | 26,108 | 1,427,704 | 16,210 | 4,032 | 20,242 | 1,447,946 |
| Minnesota | 0 | 1,118,716 | 33,748 | 1,152,464 | 78 | 11,439 | 11,517 | 1,163,981 |
| Wisconsin | 418,964 | 176,787 | 2,319,883 | 2,915,634 | 163,745 | 74,934 | 238,679 | 3,154,313 |
| Exported 3/ | 17,098 | 75,011 | 9,014 | 101,123 | 0 | 0 | 0 | 0 |
| Total | 1,837,658 | 1,370,514 | 2,388,753 | 5,596,925 | 180,033 | 90,405 | 270,438 | 5,766,240 |

1/ Vertical columns of figures under box heading "Production by States" present the amount of pulpwood cut in each State.

2/ Mostly western States.

3/ Pulpwood shipped to mills outside of region.

4/ Ponderosa pine

5/ Includes Ponderosa pine from other U.S.

1974. For the fourth consecutive year, red pine production advanced to a new high. Other record harvests included white pine, yellow birch, balsam poplar, and white oak.

Spruce and hemlock output dropped to modern day lows contributing to the 1 percent decline in total production. Hard maple pulpwood production sank 59,000 cords. Other species each showing declines of more than 20,000 cords included jack pine, white birch, and elm.

Lake States loggers produced 437,500 cords of whole tree chips,[4] off slightly from 1980, and 8 percent of the pulpwood from all sources in 1981. Michigan continued as the leading producer and Wisconsin produced nominal amounts. Production of whole tree chips by species group and State was:

| **State** | **Softwoods** | **Aspen** | **Other hardwoods** |
|---|---|---|---|
| | | (Thousand cords) | |
| Michigan | 17.1 | 167.9 | 124.8 |
| Minnesota | — | 94.8 | 9.5 |
| Wisconsin | 1.1 | 19.4 | 2.9 |

**Michigan**—Demand for Michigan pulpwood fell 7 percent to 1.84 million cords. Aspen, hard maple, and jack pine production fell substantially. Loggers cut more than one-half of the aspen and about one-half of the pine in the Northern Lower Peninsula. Top-producing counties were Marquette, Iron, Menominee, and Delta.

**Minnesota**—Minnesota furnished 1.37 million cords. Aspen output climbed 102,000 cords but was partially offset by a 242,000 cord drop in spruce harvesting. Pine and spruce harvests were the lowest since World War II. St. Louis, Itasca, Koochiching, and Beltrami Counties supplied 64 percent of the roundwood.

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[4] *Pulpwood produced from chipping entire trees (all portions of trees above ground, except the stumps).*

**Wisconsin**—Wisconsin's record high 2.39 million cord production was 40 percent aspen, 9 percent jack pine, 8 percent red pine, and 10 percent hardwood mill residue. Demand was strong for Wisconsin aspen, balsam fir, and red pine. Aspen harvesting climbed sharply in the Northwestern Unit; balsam fir cutting continued rising in the Northeastern Unit for the third consecutive year. Counties furnishing more than 100,000 cords each were Marinette, Oneida, Bayfield, Forest, Douglas, Sawyer, and Price.

In this report we will show the distribution of the harvest in two ways: first, the amount of pulpwood cut relative to the growing stock volume in major pulpwood species (fig. 1); and second, the amount of pulpwood cut relative to commercial forest area (fig. 2). Cutting pressure weakened in all of Michigan, except the Southern Lower Peninsula, and strengthened briskly in Northwestern and Northeastern Wisconsin.

## Receipts

Thirty-eight pulp, 3 particleboard, 1 oriented strand board, and 3 waferboard mills received 5.77 million cords of pulpwood in 1981. Of the 45 operating mills, 41 used aspen, 21 used birch, and 18 used maple (table 2).

Softwood residue imports from Canada fell after eight consecutive years of record-setting higher imports. Softwood residue shipments to the Lake States from other areas of the U.S. sank to near the level in 1968; principal suppliers were South Dakota and Wyoming.

**Michigan**—Only 46,000 of the 1.45 million cords procured were from out-of-State. Species in highest demand were aspen, soft maple, jack pine, and red oak.

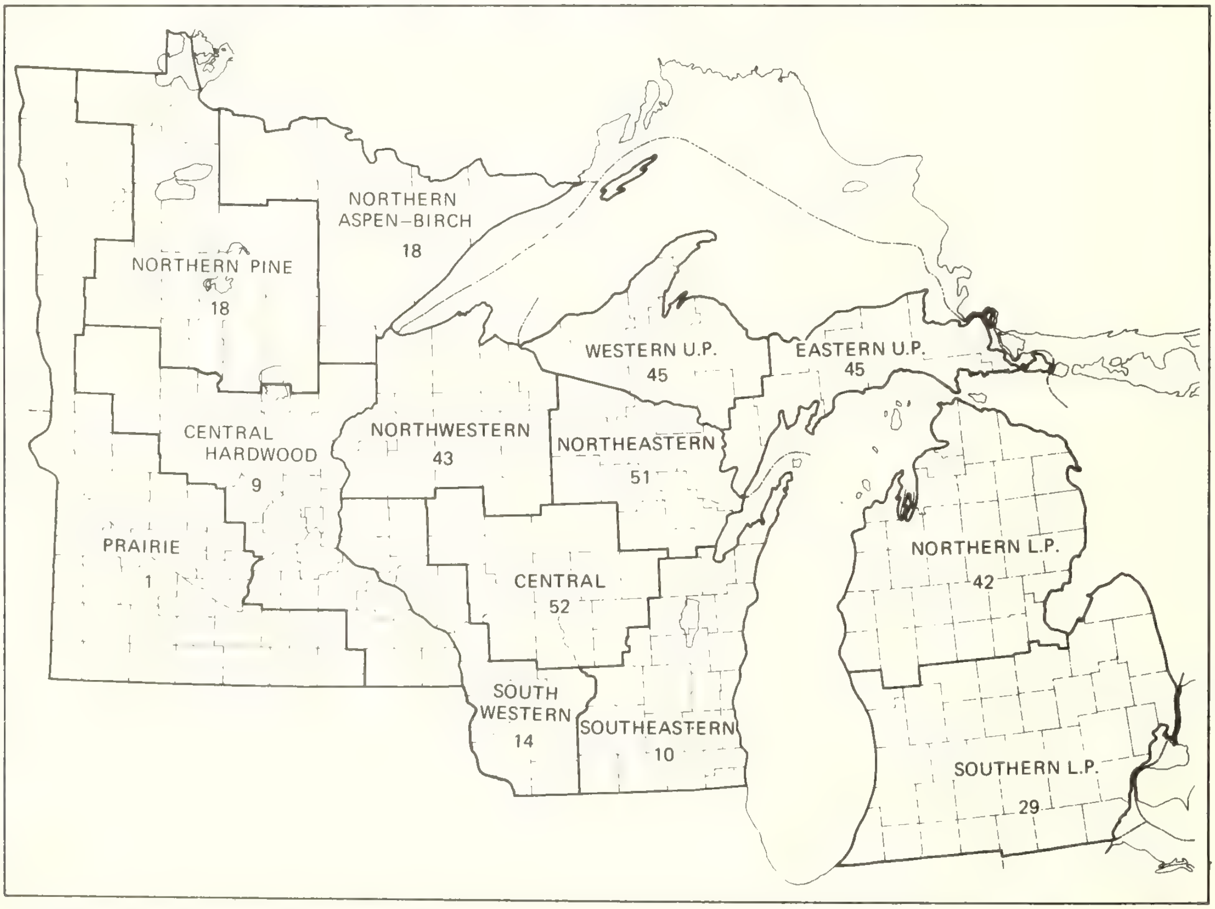

Figure 1.—*Cords of pulpwood (including chips from roundwood) harvested per 1,000 cords of merchantable volume in principal pulpwood species by Forest Inventory Unit, 1981. Merchantable volume was determined during the last forest inventory in each State.*

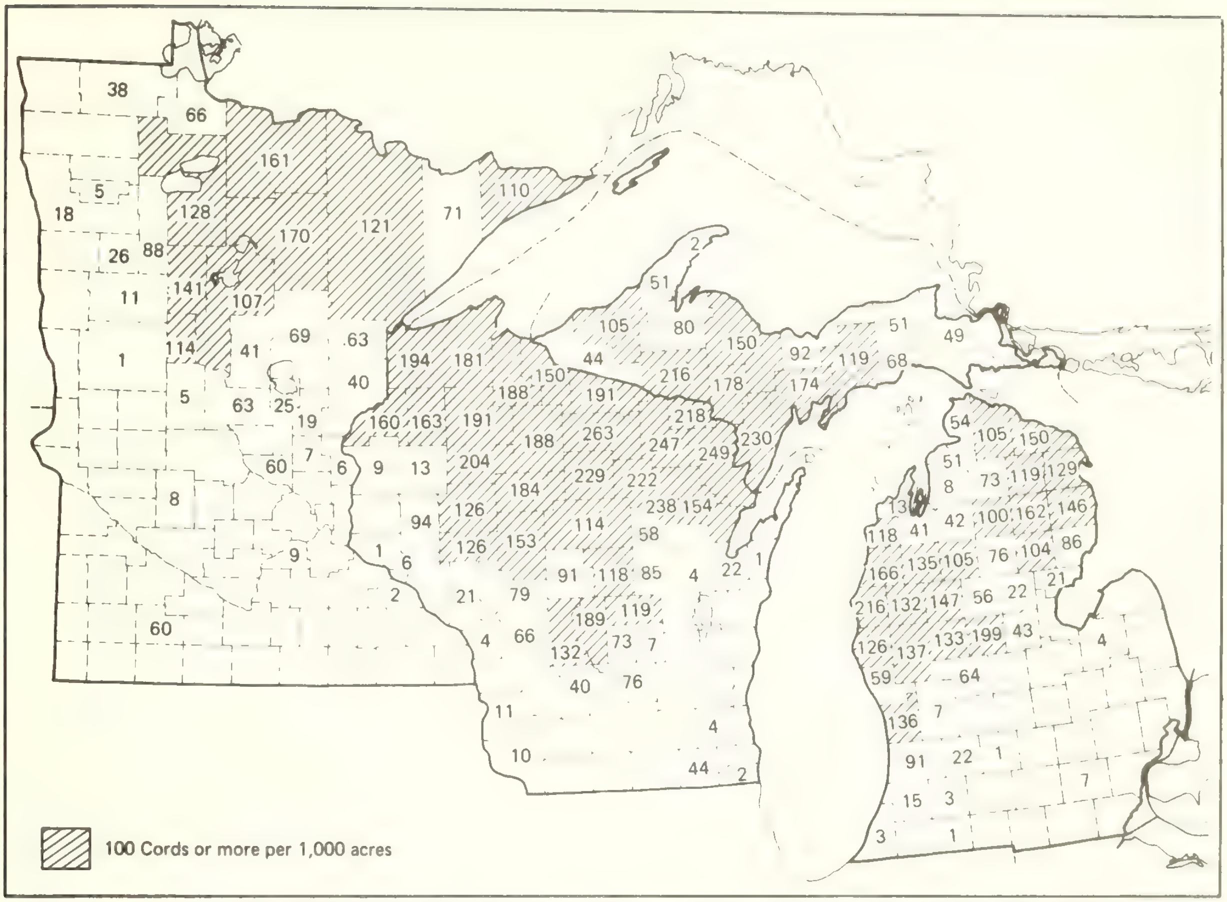

Figure 2.—*Cords of pulpwood cut per 1,000 acres of stocked commercial forest land in principal pulpwood-producing counties, 1981. Acres of stocked commercial forest land were determined during the last forest inventory in each State.*

**Wisconsin**—Receipts were 3.15 million cords including 419,000 cords from Michigan, 177,000 cords from Minnesota, 164,000 cords from other (primarily western) States, and 75,000 cords from Canada. Leading imported species were aspen, spruce, jack pine, and hard maple. Canadian shipments were spruce and softwood residue. More than three-fourths of the softwood residue requirements was procured from outside the Lake States.

## Industry Trends and Analysis

Average daily pulp production rose 2 percent to 10,730 tons per day (table 3). Minnesota contributed most of the increase.

Another waferboard plant and the first oriented strand board plant (OSB) in the Lake States began operations in 1981. Annual production capacity of the Lake States particleboard, waferboard, and OSB plants was 520 million square feet as shown below:

| Company | Location | Capacity[5] Million square feet (⅛-inch basis) |
|---|---|---|
| Champion International Corp. | Gaylord, MI | 175 |
| Blandin Wood Products Co. | Grand Rapids, MN | 45 |
| Northwood Panelboard Co. | Bemidji, MN | 80 |
| Potlatch Corp. | Bemidji, MN | 75 |
| Louisiana-Pacific Corp. | Hayward, WI | 65 |
| Rodman Industries | Marinette, WI | 15 |
| Weyerhaeuser Co. | Marshfield, WI | 65 |
| | | 520 |

Two other OSB plants are likely to be completed in 1982. However, until the economy and housing starts move upward significantly, the OSB and waferboard plants will probably produce at rates considerably below capacity.

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[5] *Directory of the Forest Products Industry, 1982.*

Table 2.--Numbers of industrial plants in the Lake States using a particular species or residue for pulping and composition board in 1981

| Species and kind of material | Total Lake States | Michigan | Minnesota | Wisconsin |
|---|---|---|---|---|
| Aspen | 41 | 8 | 11 | 22 |
| Balsam fir | 17 | 4 | 5 | 8 |
| Birch | 21 | 6 | 1 | 14 |
| Hemlock | 9 | 2 | - | 7 |
| Pine | 10 | 4 | 2 | 4 |
| Spruce | 16 | 2 | 5 | 9 |
| Tamarack | 7 | 1 | 2 | 4 |
| Maple | 18 | 7 | - | 11 |
| Oak | 16 | 7 | - | 9 |
| Other hardwoods | 22 | 7 | 6 | 9 |
| Softwood residue | 13 | 2 | 2 | 9 |
| Hardwood residue | 20 | 7 | 1 | 12 |
| Total plants[1] | 45 | 8 | 11 | 26 |

[1] Some plants use more than one species, so numbers in columns cannot be added.

Waferboard and OSB plants have been built in the Lake States to take advantage of increasing inventories of aspen and other hardwoods that are anticipated to be available at prices more economically attractive than softwoods, particularly softwoods in the western U.S. Another attraction is the location of these plants near major Midwest markets. This should provide favorable transportation costs compared to similar costs for competitive products from the West and South.

In terms of volume, red pine is a more important pulp species than spruce and is approaching the production of balsam fir. Although jack pine output has stagnated since 1975, red pine production for pulpwood has advanced every year except 1977. Using 3-year moving averages, annual pulpwood output from jack pine and red pine for 1975 thru 1980 was:

| Year | Jack pine | Red pine |
|---|---|---|
| | (Thousand cords) | |
| 1975 | 555 | 150 |
| 1976 | 530 | 156 |
| 1977 | 547 | 185 |
| 1978 | 570 | 205 |
| 1979 | 555 | 240 |
| 1980 | 518 | 265 |

Based on these averages, the annual rate of increase for red pine during this period was 12 percent. Red pine plantations are and should continue to be an important source of pulpwood.

# CENTRAL STATES

## Production

Pulpwood production slipped nominally to 428,000 cords in 1981 (table 4). Central States mill residue was in greater demand but was offset by declining roundwood output in each species group. Exports from the Central States continued to increase, setting another record for the thirteenth year in the last sixteen. Mills in Kentucky, Michigan, Wisconsin, Ohio, and Tennessee procured 58 percent of the output.

Indiana, the top producer, and Missouri increased production modestly. Production fell sharply in Iowa and slightly in Illinois.

Loggers cut pulpwood in 37 counties in Illinois, 25 counties in Indiana, 21 counties in Missouri, and 10 counties in Iowa (fig. 3). Logging territories expanded in northwest Indiana and northeast Missouri

Table 3.--Active woodpulp mills in the Lake States, by location, type of pulp produced, and average daily production, 1981

(In tons per 24 hours)[1/]

| | | Average production | | | | |
|---|---|---|---|---|---|---|
| Company | Location | Total | Sulfite | Kraft | Groundwood and other mechanical | Semi-chemical |
| Michigan | | | | | | |
| Abitibi-Price Inc. | Alpena | 430 | 0 | 0 | 430 | 0 |
| Champion International | Ontonagon | 440 | 0 | 0 | 0 | 440 |
| Manistique Pulp and Paper Co. | Manistique | 90 | 0 | 0 | 90 | 0 |
| Mead Corp. | Escanaba | 750 | 0 | 600 | 150 | 0 |
| Menasha Corp. | Otsego | 225 | 0 | 0 | 0 | 225 |
| Packaging Corp. of America | Filer City | 600 | 0 | 0 | 0 | 600 |
| Warren Co., S.D. | Muskegon | 250 | 0 | 250 | 0 | 0 |
| Total | 7 Plants | 2,785 | 0 | 850 | 670 | 1,265 |
| Minnesota | | | | | | |
| Blandin Paper Co. | Grand Rapids | 325 | 0 | 0 | 325 | 0 |
| Hennepin Paper Co. | Little Falls | 75 | 0 | 0 | 75 | 0 |
| Boise Cascade Corp. | International Falls | 890 | 0 | 350 | 540 | 0 |
| Potlatch Corp. | Cloquet | 475 | 0 | 475 | 0 | 0 |
| Superwood Corp. | Bemidji | 90 | 0 | 0 | 90 | 0 |
| St.Regis Paper Co. | Sartell | 385 | 0 | 0 | 385 | 0 |
| Superwood Corp. | Duluth | 350 | 0 | 0 | 350 | 0 |
| Conwed Corp. | Cloquet | 55 | 0 | 0 | 55 | 0 |
| Total | 8 Plants | 2,645 | 0 | 825 | 1,820 | 0 |
| Wisconsin | | | | | | |
| American Can Co. | Green Bay | 150 | 150 | 0 | 0 | 0 |
| Weyerhaeuser Co. | Rothschild | 200 | 200 | 0 | 0 | 0 |
| Badger Paper Mills | Peshtigo | 100 | 100 | 0 | 0 | 0 |
| Appleton Papers Inc. | Combined locks | 200 | 0 | 0 | 200 | 0 |
| Consolidated Papers, Inc. | Appleton | 130 | 130 | 0 | 0 | 0 |
| Consolidated Papers, Inc. | Stevens Point | 230 | 0 | 0 | 230 | 0 |
| Consolidated Papers, Inc. | Wisconsin Rapids | 750 | 0 | 450 | 300 | 0 |
| Green Bay Packaging, Inc. | Green Bay | 200 | 0 | 0 | 0 | 200 |
| Flambeau Paper Co. | Park Falls | 110 | 110 | 0 | 0 | 0 |
| Midtec Paper Corp. | Kimberly | 150 | 0 | 0 | 150 | 0 |
| Pentair Industries | Niagara | 210 | 0 | 0 | 210 | 0 |
| Mosinee Paper Mills Co. | Mosinee | 210 | 0 | 210 | 0 | 0 |
| Nekoosa Papers Inc. | Nekoosa | 335 | 0 | 335 | 0 | 0 |
| Nekoosa Papers Inc. | Port Edwards | 235 | 235 | 0 | 0 | 0 |
| Owens-Illinois | Tomahawk | 1000 | 0 | 0 | 0 | 1,000 |
| Procter and Gamble Inc. | Green Bay | (2/) | (2/) | (2/) | (2/) | (2/) |
| Rhinelander Paper Co. | Rhinelander | 75 | 75 | 0 | 0 | 0 |
| Genstar Corp. | Cornell | 100 | 0 | 0 | 100 | 0 |
| Superior Fiber Products Co. | Superior | 180 | 0 | 0 | 180 | 0 |
| Thilmany Pulp and Paper Co. | Kaukauna | 400 | 0 | 400 | 0 | 0 |
| Tomahawk Pulp Co., Inc. | Tomahawk | 50 | 0 | 0 | 50 | 0 |
| Wausau Paper Mills Co. | Brokaw | 185 | 185 | 0 | 0 | 0 |
| Superwood Corp. | Phillips | 100 | 0 | 0 | 100 | 0 |
| Total | 23 Plants | 5,300 | 1,185 | 1,395 | 1,520 | 1,200 |
| All States | 38 Plants | 10,730 | 1,185 | 3,070 | 4,010 | 2,465 |

[1/] Lockwood's Directory of the Paper and Allied Industries--1982.
[2/] Capacity not available.

Table 4.--Production and imports of pulpwood, Central States, 1981

(In standard cords,unpeeled)[1]

| Species and destination | Production by States[2] | | | | | Imports | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Illinois | Indiana | Iowa | Missouri | Regional total | Lake States | Other U.S. | Total imports | Total receipts |
| Roundwood | | | | | | | | | |
| Softwoods | | | | | | | | | |
| Illinois | 4,603 | 1,400 | 0 | 0 | 6,003 | 1,120 | 0 | 1,120 | 7,123 |
| Exported[3] | 11,808 | 190 | 0 | 61 | 12,059 | 0 | 0 | 0 | 0 |
| Total | 16,411 | 1,590 | 0 | 61 | 18,062 | 1,120 | 0 | 1,120 | 7,123 |
| Soft hardwoods | | | | | | | | | |
| Illinois | 4,856 | 5,172 | 0 | 0 | 10,028 | 444 | 720 | 1,164 | 11,192 |
| Ind.,Iowa,Mo.[4] | 5,612 | 10,764 | 2,580 | 3,250 | 22,206 | 1,157 | 1,186 | 2,343 | 24,549 |
| Exported[3] | 9,141 | 0 | 0 | 998 | 10,139 | 0 | 0 | 0 | 0 |
| Total | 19,609 | 15,936 | 2,580 | 4,248 | 42,373 | 1,601 | 1,906 | 3,507 | 35,741 |
| Hard hardwoods | | | | | | | | | |
| Illinois | 160 | 0 | 0 | 0 | 160 | 0 | 0 | 0 | 160 |
| Ind.,Iowa,Mo.[4] | 6,208 | 10,711 | 7,194 | 8,521 | 32,634 | 1,715 | 1,180 | 2,895 | 35,529 |
| Exported[3] | 14,002 | 11,093 | 0 | 9,065 | 34,160 | 0 | 0 | 0 | 0 |
| Total | 20,370 | 21,804 | 7,194 | 17,586 | 66,954 | 1,715 | 1,180 | 2,895 | 35,689 |
| Total roundwood | | | | | | | | | |
| Illinois | 9,619 | 6,572 | 0 | 0 | 16,191 | 1,564 | 720 | 2,284 | 18,475 |
| Ind.,Iowa,Mo[4] | 11,820 | 21,475 | 9,774 | 11,771 | 54,840 | 2,872 | 2,366 | 5,238 | 60,078 |
| Exported[3] | 34,951 | 11,283 | 0 | 10,124 | 56,358 | 0 | 0 | 0 | 0 |
| Total | 56,390 | 39,330 | 9,774 | 21,895 | 127,389 | 4,436 | 3,086 | 7,522 | 78,553 |
| Residue, softwood | | | | | | | | | |
| Illinois | 260 | 0 | 0 | 0 | 260 | 702 | 486 | 1,188 | 1,448 |
| Exported[3] | 180 | 0 | 6,585 | 2,242 | 9,007 | 0 | 0 | 0 | 0 |
| Total | 440 | 0 | 6,585 | 2,242 | 9,267 | 702 | 486 | 1,188 | 1,448 |
| Residue, hardwood | | | | | | | | | |
| Illinois | 2,105 | 0 | 0 | 0 | 2,105 | 0 | 0 | 0 | 2,105 |
| Ind.,Iowa,Mo.[4] | 18,918 | 39,546 | 15,850 | 31,691 | 106,005 | 5,688 | 0 | 5,688 | 111,693 |
| Exported[3] | 22,368 | 106,287 | 0 | 54,998 | 183,653 | 0 | 0 | 0 | 0 |
| Total | 43,391 | 145,833 | 15,850 | 86,689 | 291,763 | 5,688 | 0 | 5,688 | 113,798 |
| All wood material | | | | | | | | | |
| Illinois | 11,984 | 6,572 | 0 | 0 | 18,556 | 2,266 | 1,206 | 3,472 | 22,028 |
| Ind.,Iowa,Mo.[4] | 30,738 | 61,021 | 25,624 | 43,462 | 160,845 | 8,560 | 2,366 | 10,926 | 171,771 |
| Exported[3] | 57,499 | 117,570 | 6,585 | 67,364 | 249,018 | 0 | 0 | 0 | 0 |
| Total | 100,221 | 185,163 | 32,209 | 110,826 | 428,419 | 10,826 | 3,572 | 14,398 | 193,799 |

[1] Factors used in converting to standard green cords (128 cu. ft.) were: 4,500 pounds of soft hardwood roundwood; 5,000 pounds of hard hardwood or coniferous roundwood; 4,100 pounds of softwood chips (green); 4,400 pounds of hardwood chips (green); 2,500 Pounds of chips (all species, dry).

[2] Vertical columns of figures under box heading--Production by States--present the amount of pulpwood cut in each State.

[3] Pulpwood shipped to mills outside the region.

[4] Combined to prevent disclosure of individual mill receipts.

and contracted in eastern Indiana, western Missouri, and south-central Illinois.

# RECEIPTS

Pulpwood receipts at seven Central States pulpmills were 194,000 cords, down 12 percent from 1980. All residue and roundwood species groups participated in the decline except hard hardwoods. Receipts in Illinois plunged to 22,000 cords, the lowest demand since records were first compiled in 1955. Four Illinois mill closings in 1981 led to the low demand in that State. Most of the decline was concentrated in hardwood residue. Imports declined to 7 percent of total receipts, less than half the imports in 1980. Six States—Wisconsin, Kentucky, Kansas, Minnesota, Ohio, and Tennessee—shipped wood to the Central States.

# Industry Trends and Analysis

Average daily pulp production dropped to 840 tons per day (table 5). Five mills closed during 1980; some may be permanent closings. In addition, two other Illinois mills closed permanently in December 1981. Illinois is likely to have only one operating mill in 1982 compared to seven mills as recently as 1979. All of the mills that closed in 1980 and 1981 produced organic (wood-based) roofing felt—demand for roofing materials has declined severely during the recession.

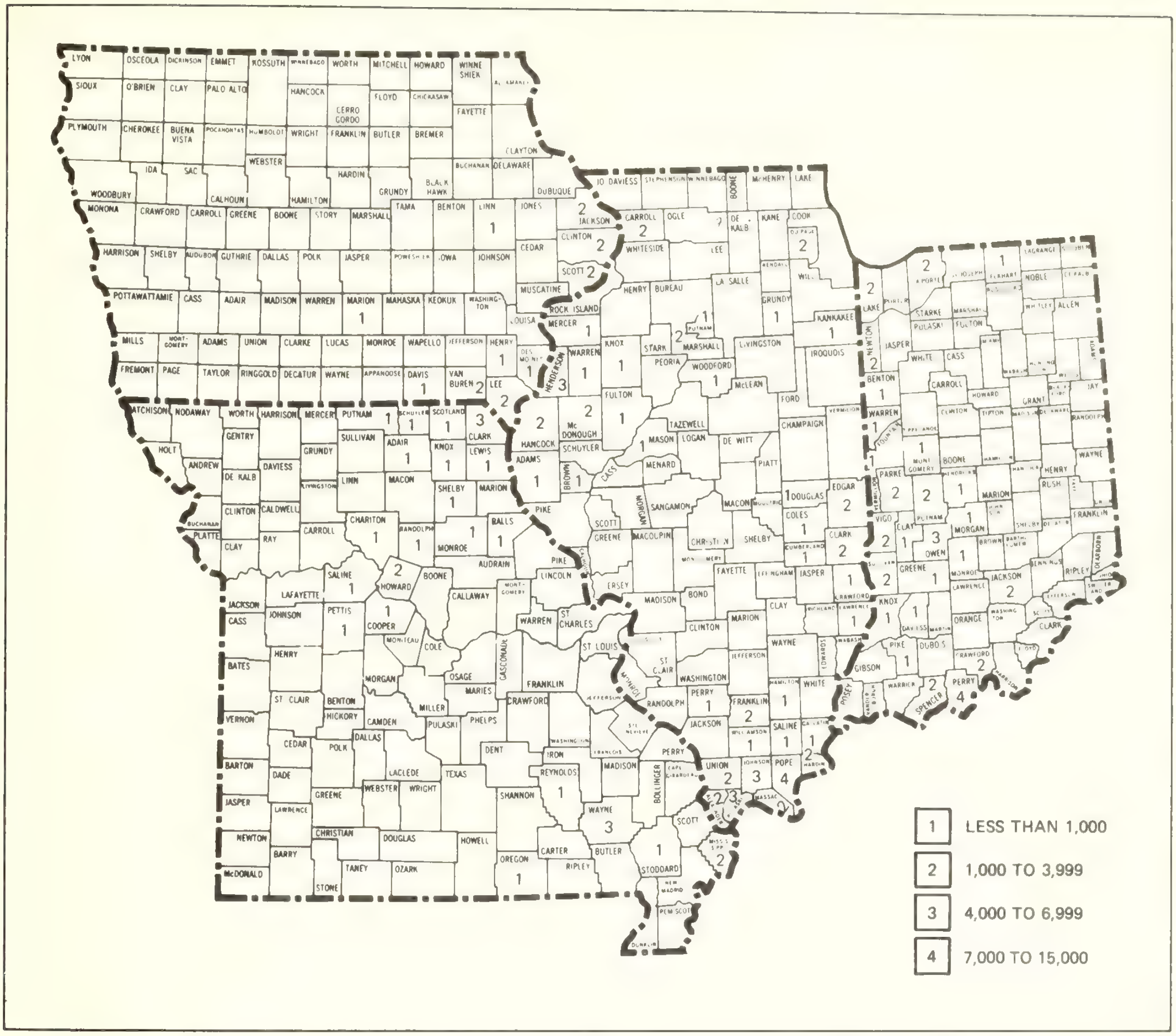


Figure 3.—*Harvest of pulpwood (including chips from roundwood) in the Central States by counties, in standard cords, 1981.*

In recent years nearly all roofing felt producers have either invested in new capacity or are studying the possibilities, and all of these expansions use fiberglass rather than wood fiber. With roofing market shares reduced by lower demand, market shares are being transferred to new fiberglass mat machines from organic felt machines, resulting in closure of some organic roofing felt plants. These shifts from organic to fiberglass felts is likely to continue. Organic felts have lost price competitiveness to fiberglass felts because the price of the asphalt used in organic felts has risen rapidly in recent years.

Table 5.--Active woodpulp mills in the Central States, by location, type of pulp produced, and average daily production, 1981

(In tons per 24 hours)[1]

| Company | Location | Average production | | | | |
|---|---|---|---|---|---|---|
| | | Total | Sulfite | Kraft | Groundwood and other Mechanical | Semi-chemical |
| Illinois | | | | | | |
| Bird and Son, Inc. | Chicago | 40 | 0 | 0 | 40 | 0 |
| Celotex Corp. | Peoria | 90 | 0 | 0 | 90 | 0 |
| GAF Corp. | Joliet | 150 | 0 | 0 | 150 | 0 |
| Total | 3 plants | 280 | 0 | 0 | 280 | 0 |
| Indiana | | | | | | |
| Weston Paper and Mfg. Co. | Terre Haute | 270 | 0 | 0 | 0 | 270 |
| Total | 1 plant | 270 | 0 | 0 | 0 | 270 |
| Iowa | | | | | | |
| Celotex Corp. | Dubuque | 90 | 0 | 0 | 90 | 0 |
| Consolidated Packaging Corp. | Fort Madison | 140 | 0 | 0 | 0 | 140 |
| Total | 2 plants | 230 | 0 | 0 | 90 | 140 |
| Missouri | | | | | | |
| Huebert Fibreboard, Inc. | Booneville | 60 | 0 | 0 | 60 | 0 |
| Total | 1 plant | 60 | 0 | 0 | 60 | 0 |
| All States | 7 plants | 840 | 0 | 0 | 430 | 410 |

[1] Lockwood's Directory of the Paper and Allied Industries-1982.

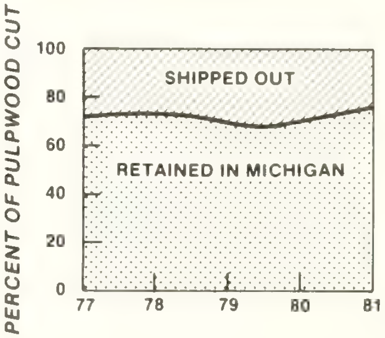
# APPENDIX

Table 6.--Lake States pulpwood production[1] by State of origin and destination, 1977-1981

(In thousand standard cords, unpeeled)

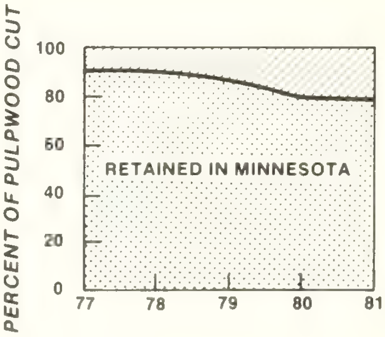
MICHIGAN

| | Total cut | Destination of pulpwood | | | |
|---|---|---|---|---|---|
| | | Minnesota | Wisconsin | Michigan | Other |
| 1977 | 1,595 | - | 407 | 1,159 | 29 |
| 1978 | 1,675 | - | 404 | 1,248 | 23 |
| 1979 | 1,981 | (2/) | 516 | 1,428 | 37 |
| 1980 | 1,969 | - | 490 | 1,443 | 36 |
| 1981 | 1,838 | - | 419 | 1,402 | 17 |
| 5 year average | 1,812 | (2/) | 447 | 1,336 | 29 |



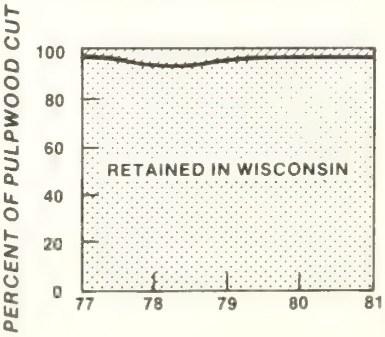
MINNESOTA

| | Total cut | Destination of pulpwood | | | |
|---|---|---|---|---|---|
| | | Minnesota | Wisconsin | Michigan | Other |
| 1977 | 1,333 | 1,149 | 154 | - | 30 |
| 1978 | 1,338 | 1,155 | 162 | - | 21 |
| 1979 | 1,458 | 1,226 | 169 | - | 63 |
| 1980 | 1,333 | 1,044 | 216 | - | 73 |
| 1981 | 1,371 | 1,119 | 177 | - | 75 |
| 5 year average | 1,367 | 1,139 | 176 | - | 52 |



WISCONSIN

| | Total cut | Destination of pulpwood | | | |
|---|---|---|---|---|---|
| | | Minnesota | Wisconsin | Michigan | Other |
| 1977 | 1,816 | 26 | 1,714 | 64 | 12 |
| 1978 | 1,895 | 26 | 1,779 | 70 | 20 |
| 1979 | 2,109 | 20 | 2,024 | 47 | 18 |
| 1980 | 2,362 | 18 | 2,297 | 35 | 12 |
| 1981 | 2,389 | 34 | 2,320 | 26 | 9 |
| 5 year average | 2,114 | 25 | 2,027 | 48 | 14 |



[1] Production in 1977-1978 does not include wood for particleboard or waferboard plants.

[2] Less than 500 cords.

## Table 7.--Lake States pulpwood production from roundwood by Forest Inventory Unit and destination by State, 1981

(In hundred standard cords, unpeeled)

| Unit | Total cut | Destination of pulpwood | | | |
|---|---|---|---|---|---|
| | | Michigan | Minnesota | Wisconsin | Other |
| MICHIGAN | | | | | |
| E. Upper Peninsula | 4,136 | 2,885 | 0 | 1,133 | 118 |
| W. Upper Peninsula | 5,174 | 2,620 | 0 | 2,554 | 0 |
| N. Lower Peninsula | 6,928 | 6,784 | 0 | 91 | 53 |
| S. Lower Peninsula | 478 | 478 | 0 | 0 | 0 |
| Total roundwood | 16,716 | 12,767 | 0 | 3,778 | 171 |
| Total residue | 1,660 | 1,249 | 0 | 411 | 0 |
| Total | 18,376 | 14,016 | 0 | 4,189 | 171 |
| MINNESOTA | | | | | |
| Aspen-Birch | 6,355 | 0 | 4,952 | 693 | 710 |
| Northern Pine | 5,970 | 0 | 5,004 | 966 | 0 |
| Central Hardwood | 364 | 0 | 320 | 44 | 0 |
| Prairie | 16 | 0 | 4 | 12 | 0 |
| Total roundwood | 12,705 | 0 | 10,280 | 1,715 | 710 |
| Total residue | 1,001 | 0 | 908 | 53 | 40 |
| Total | 13,706 | 0 | 11,188 | 1,768 | 750 |
| WISCONSIN | | | | | |
| Northeastern | 8,799 | 55 | 0 | 8,744 | 0 |
| Northwestern | 8,700 | 5 | 337 | 8,358 | 0 |
| Central | 3,149 | 0 | 0 | 3,133 | 16 |
| Southwestern | 246 | 0 | 0 | 217 | 29 |
| Southeastern | 87 | 0 | 0 | 87 | 0 |
| Total roundwood | 20,981 | 60 | 337 | 20,539 | 45 |
| Total residue | 2,907 | 202 | 0 | 2,659 | 46 |
| Total | 23,888 | 262 | 337 | 23,198 | 91 |

Table 8.--Lake States pulpwood production[1/] from roundwood by species, State, and Forest Inventory Unit, 1977-1981.

(In thousand standard cords, unpeeled)

| Unit | Aspen | | | | | Balsam fir | | | | | Birch | | | | | Hemlock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Annual production | | | | | Annual production | | | | | Annual production | | | | | Annual production | | | | |
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1977 | 1978 | 1979 | 1980 | 1981 | 1977 | 1978 | 1979 | 1980 | 1981 | 1977 | 1978 | 1979 | 1980 | 1981 |
| MICHIGAN | | | | | | | | | | | | | | | | | | | | |
| Eastern Upper Peninsula | 106 | 103 | 125 | 116 | 89 | 48 | 44 | 43 | 57 | 57 | 22 | 28 | 35 | 29 | 36 | 31 | 24 | 26 | 32 | 23 |
| Western Upper Peninsula | 195 | 220 | 204 | 209 | 201 | 45 | 42 | 41 | 46 | 42 | 29 | 46 | 53 | 40 | 44 | 31 | 24 | 19 | 26 | 16 |
| Northern Lower Peninsula | 222 | 257 | 375 | 374 | 350 | 2 | 1 | 1 | 6 | 5 | 11 | 16 | 21 | 34 | 25 | (2/) | (2/) | -- | (2/) | (2/) |
| Southern Lower Peninsula | 9 | 6 | 5 | 6 | 12 | -- | -- | -- | -- | -- | (2/) | (2/) | (2/) | (2/) | (2/) | -- | -- | -- | -- | -- |
| Total | 532 | 586 | 709 | 705 | 652 | 95 | 87 | 85 | 109 | 104 | 62 | 90 | 109 | 103 | 105 | 62 | 48 | 45 | 58 | 39 |
| MINNESOTA | | | | | | | | | | | | | | | | | | | | |
| Aspen-Birch | 375 | 363 | 392 | 313 | 352 | 60 | 59 | 72 | 73 | 69 | 15 | 2 | 3 | 11 | 9 | -- | -- | -- | -- | -- |
| Northern Pine | 292 | 306 | 404 | 357 | 422 | 39 | 37 | 46 | 38 | 31 | 13 | 5 | 1 | 4 | 2 | -- | -- | -- | -- | -- |
| Central Hardwood | 30 | 35 | 41 | 29 | 27 | -- | -- | (2/) | -- | -- | 2 | 2 | 3 | (2/) | (2/) | -- | -- | -- | -- | -- |
| Prairie | -- | -- | 1 | (2/) | (2/) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 697 | 704 | 838 | 699 | 801 | 99 | 96 | 118 | 111 | 100 | 30 | 9 | 7 | 15 | 11 | -- | -- | -- | -- | -- |
| WISCONSIN | | | | | | | | | | | | | | | | | | | | |
| Northeastern | 334 | 331 | 364 | 459 | 415 | 57 | 53 | 60 | 66 | 79 | 54 | 62 | 76 | 91 | 74 | 32 | 30 | 26 | 26 | 24 |
| Northwestern | 329 | 300 | 319 | 326 | 469 | 15 | 21 | 23 | 35 | 25 | 44 | 53 | 63 | 80 | 73 | 8 | 19 | 13 | 6 | 4 |
| Central | 31 | 37 | 66 | 85 | 79 | 1 | 1 | 1 | 1 | 1 | 5 | 6 | 11 | 15 | 12 | 3 | 4 | 1 | 2 | 1 |
| Southwestern | 1 | 1 | 1 | 1 | 1 | -- | -- | -- | -- | (2/) | (2/) | (2/) | (2/) | (2/) | (2/) | -- | -- | -- | -- | -- |
| Southeastern | 1 | (2/) | 1 | 2 | 1 | -- | (2/) | -- | -- | -- | (2/) | (2/) | 1 | (2/) | (2/) | -- | -- | -- | -- | -- |
| Total | 696 | 669 | 751 | 873 | 965 | 73 | 75 | 84 | 102 | 105 | 103 | 121 | 151 | 186 | 159 | 43 | 53 | 40 | 34 | 29 |
| Lake States | 1,925 | 1,959 | 2,298 | 2,277 | 2,418 | 267 | 258 | 287 | 322 | 309 | 195 | 220 | 267 | 304 | 275 | 105 | 101 | 85 | 92 | 68 |

(Table 8 continued on next page)

[1/] Production in 1977-1978 does not include wood for particleboard or waferboard plants.

[2/] Less than 500 cords.

[3/] Includes small quantity of cedar not shown in other parts of table.

(Table 8 continued)

| Unit | Pine | | | | | Spruce | | | | | Tamarack | | | | | Other hardwoods | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Annual production | | | | | Annual production | | | | | Annual production | | | | | Annual production | | | | |
| | 1977 | 1978 | 1979 | 1980 | 1981 | 1977 | 1978 | 1979 | 1980 | 1981 | 1977 | 1978 | 1979 | 1980 | 1981 | 1977 | 1978 | 1979 | 1980 | 1981 |
| MICHIGAN | | | | | | | | | | | | | | | | | | | | |
| Eastern Upper Peninsula | 82 | 85 | 119 | 70 | 56 | 27 | 25 | 21 | 34 | 24 | 2 | 1 | 1 | 3 | 3 | 69 | 73 | 83 | 124 | 119 |
| Western Upper Peninsula | 49 | 50 | 48 | 53 | 45 | 21 | 18 | 17 | 23 | 19 | 1 | 1 | 1 | 3 | 3 | 84 | 134 | 174 | 163 | 143 |
| Northern Lower Peninsula | 119 | 122 | 166 | 124 | 118 | (2/) | (2/) | 1 | 1 | 2 | -- | -- | -- | -- | -- | 162 | 179 | 194 | 206 | 194 |
| Southern Lower Peninsula | 12 | 20 | 17 | 21 | 18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18 | 3 | 5 | 8 | 17 |
| Total | 262 | 277 | 350 | 268 | 237 | 48 | 43 | 39 | 58 | 45 | 3 | 2 | 2 | 6 | 6 | 333 | 389 | 456 | 501 | 473 |
| MINNESOTA | | | | | | | | | | | | | | | | | | | | |
| Aspen-Birch | 97 | 89 | 75 | 66 | 71 | 110 | 126 | 119 | 127 | 93 | 24 | 18 | 18 | 22 | 11 | 12 | 17 | 18 | 30 | 31 |
| Northern Pine | 73 | 89 | 75 | 76 | 70 | 43 | 38 | 34 | 43 | 34 | 15 | 10 | 16 | 18 | 18 | 5 | 9 | 9 | 16 | 19 |
| Central Hardwood | 4 | 8 | 8 | 9 | 6 | (2/) | (2/) | (2/) | (2/) | (2/) | (2/) | -- | (2/) | (2/) | (2/) | 8 | 13 | 4 | 2 | 3 |
| Prairie | -- | -- | -- | -- | (2/) | -- | (2/) | -- | (2/) | (2/) | 3 | 2 | 2 | 3 | 1 | -- | -- | -- | (2/) | -- |
| Total | 174 | 186 | 158 | 151 | 147 | 153 | 164 | 153 | 170 | 127 | 42 | 30 | 36 | 43 | 30 | 25 | 39 | 31 | 48 | 53 |
| WISCONSIN | | | | | | | | | | | | | | | | | | | | |
| Northeastern | 68 | 98 | 95 | 95 | 111 | 16 | 16 | 14 | 27 | 22 | 2 | 2 | 1 | 2 | 1 | 152 | 113 | 150 | 181 | 154 |
| Northwestern | 103 | 122 | 113 | 113 | 131 | 3 | 3 | 4 | 5 | 5 | 1 | 1 | 1 | 1 | 3 | 104 | 159 | 165 | 186 | 160 |
| Central | 113 | 121 | 127 | 149 | 150 | (2/) | (2/) | (2/) | 1 | (2/) | 1 | (2/) | (2/) | (2/) | 1 | 121 | 91 | 121 | 82 | 70 |
| Southwestern | 8 | 11 | 20 | 22 | 20 | -- | -- | -- | (2/) | (2/) | -- | -- | -- | -- | -- | 4 | 8 | 4 | 4 | 3 |
| Southeastern | 4 | 5 | 6 | 8 | 7 | -- | -- | 1 | (2/) | -- | -- | -- | -- | -- | -- | 2 | 2 | 1 | 2 | 2 |
| Total | 296 | 357 | 361 | 387 | 419 | 19 | 19 | 19 | 33 | 27 | 4 | 3 | 2 | 3 | 5 | 383 | 373 | 441 | 455 | 389 |
| Lake States | 732 | 820 | 869 | 806 | 803 | 220 | 226 | 211 | 261 | 199 | 49 | 35 | 40 | 52 | 41 | 741 | 801 | 928 | 1004 | 915 |

(Table 8 continued on next page)

(Table 8 continued)

MICHIGAN

| Unit | All species[3]<br>Annual production | | | | |
|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 |
| Eastern Upper Peninsula | 390 | 387 | 457 | 469 | 414 |
| Western Upper Peninsula | 458 | 537 | 561 | 566 | 517 |
| Northern Lower Peninsula | 516 | 575 | 759 | 745 | 693 |
| Southern Lower Peninsula | 39 | 29 | 27 | 35 | 48 |
| Total | 1,403 | 1,528 | 1,804 | 1,815 | 1,672 |
| MINNESOTA | | | | | |
| Aspen-Birch | 693 | 674 | 696 | 642 | 635 |
| Northern Pine | 480 | 494 | 585 | 552 | 597 |
| Central Hardwood | 44 | 58 | 56 | 40 | 36 |
| Prairie | 3 | 2 | 3 | 3 | 2 |
| Total | 1,220 | 1,228 | 1,340 | 1,237 | 1,270 |
| WISCONSIN | | | | | |
| Northeastern | 716 | 706 | 786 | 947 | 880 |
| Northwestern | 608 | 678 | 701 | 752 | 870 |
| Central | 275 | 260 | 327 | 335 | 315 |
| Southwestern | 13 | 20 | 25 | 27 | 24 |
| Southeastern | 7 | 7 | 10 | 12 | 9 |
| Total | 1,619 | 1,671 | 1,849 | 2,073 | 2,098 |
| Lake States | 4,242 | 4,427 | 4,993 | 5,125 | 5,040 |

Table 9.--Lake States pulpwood production from roundwood by county and species, 1981

(In standard cords, unpeeled)

MICHIGAN

| Unit and county[1] | Cedar | Balsam fir | Hemlock | Jack pine | Red pine | White pine | Spruce | Tamarack | Ash | Aspen | Balsam poplar | Basswood |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E. Upper Peninsula | | | | | | | | | | | | |
| Alger | 1,011 | 4,128 | 3,760 | 1,597 | 1,722 | 800 | 1,216 | 126 | 432 | 4,492 | 2,195 | 1,097 |
| Chippewa | 92 | 5,256 | 2,534 | 7,101 | 2,348 | 799 | 2,988 | 453 | 93 | 4,208 | 984 | 492 |
| Delta | 3,601 | 15,316 | 4,763 | 4,134 | 2,439 | 3,648 | 8,912 | 1,029 | 764 | 24,740 | 3,617 | 1,809 |
| Luce | 98 | 3,257 | 3,785 | 4,333 | 448 | 594 | 2,675 | 98 | 79 | 2,153 | 671 | 335 |
| Mackinac | 314 | 6,074 | 687 | 3,699 | 1,846 | 500 | 3,478 | 268 | 125 | 6,489 | 1,329 | 665 |
| Menominee | 1,139 | 15,096 | 4,241 | 522 | 2,880 | 4,448 | 2,895 | 516 | 2,277 | 36,476 | 4,066 | 2,091 |
| Schoolcraft | 844 | 7,555 | 2,785 | 8,873 | 2,052 | 834 | 2,207 | 125 | 412 | 10,778 | 3,153 | 1,576 |
| Total | 7,099 | 56,682 | 22,555 | 30,259 | 13,735 | 11,623 | 24,371 | 2,615 | 4,182 | 89,336 | 16,015 | 8,065 |
| W. Upper Peninsula | | | | | | | | | | | | |
| Baraga | 134 | 2,244 | 2,453 | 1,359 | 1,069 | 890 | 838 | 399 | 277 | 11,937 | 0 | 1,384 |
| Dickinson | 357 | 6,273 | 1,269 | 718 | 1,086 | 564 | 1,697 | 424 | 773 | 33,856 | 2,064 | 1,114 |
| Gogebic | 0 | 1,164 | 506 | 160 | 127 | 64 | 430 | 0 | 229 | 12,404 | 0 | 288 |
| Houghton | 0 | 2,552 | 2,131 | 4,159 | 447 | 219 | 990 | 961 | 143 | 6,660 | 0 | 203 |
| Iron | 161 | 12,831 | 4,608 | 3,245 | 3,152 | 2,459 | 7,655 | 261 | 1,251 | 57,203 | 449 | 992 |
| Keweenaw | 0 | 54 | 11 | 0 | 24 | 0 | 252 | 0 | 0 | 0 | 0 | 0 |
| Marquette | 3,553 | 16,704 | 4,281 | 14,315 | 7,099 | 4,159 | 6,684 | 1,060 | 659 | 30,011 | 6,669 | 3,383 |
| Ontonagon | 0 | 217 | 636 | 14 | 0 | 0 | 284 | 0 | 740 | 49,334 | 0 | 1,750 |
| Total | 4,205 | 42,039 | 15,895 | 23,970 | 13,004 | 8,355 | 18,830 | 3,105 | 4,072 | 201,405 | 9,182 | 9,114 |
| N. Lower Peninsula | | | | | | | | | | | | |
| Alcona | 0 | 122 | 0 | 1,703 | 1,326 | 0 | 9 | 0 | 473 | 27,677 | 1,398 | 111 |
| Alpena | 0 | 213 | 0 | 170 | 85 | 0 | 151 | 0 | 467 | 17,212 | 906 | 60 |
| Antrim | 0 | 0 | 0 | 0 | 61 | 0 | 0 | 0 | 4 | 720 | 0 | 0 |
| Arenac | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 898 | 43 | 12 |
| Benzie | 0 | 0 | 0 | 271 | 0 | 0 | 0 | 0 | 116 | 6,394 | 0 | 150 |
| Charlevoix | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 133 | 4,198 | 0 | 104 |
| Cheboygan | 0 | 252 | 0 | 1,516 | 0 | 0 | 34 | 0 | 667 | 24,286 | 349 | 78 |
| Clare | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 2 | 9,779 | 0 | 0 |
| Crawford | 0 | 668 | 0 | 19,099 | 322 | 0 | 0 | 0 | 10 | 4,994 | 0 | 0 |
| Emmet | 0 | 0 | 0 | 0 | 585 | 0 | 0 | 0 | 106 | 6,974 | 0 | 0 |
| Gladwin | 0 | 0 | 0 | 0 | 127 | 0 | 0 | 0 | 27 | 3,488 | 0 | 26 |
| Grand Traverse | 0 | 0 | 0 | 274 | 1,175 | 0 | 0 | 0 | 42 | 3,120 | 0 | 104 |
| Iosco | 0 | 0 | 0 | 5,471 | 2,506 | 0 | 0 | 0 | 597 | 5,811 | 133 | 18 |
| Isabella | 0 | 0 | 0 | 0 | 535 | 0 | 0 | 0 | 0 | 10,910 | 0 | 0 |
| Kalkaska | 0 | 0 | 0 | 1,935 | 0 | 0 | 0 | 0 | 27 | 5,825 | 0 | 52 |
| Lake | 0 | 0 | 0 | 11,325 | 0 | 0 | 0 | 0 | 179 | 11,775 | 0 | 149 |
| Leelanau | 0 | 0 | 0 | 0 | 695 | 0 | 0 | 0 | 0 | 291 | 0 | 0 |
| Manistee | 0 | 0 | 0 | 1,000 | 0 | 0 | 0 | 0 | 164 | 14,700 | 0 | 260 |
| Mason | 0 | 0 | 0 | 0 | 2,901 | 0 | 0 | 0 | 50 | 13,149 | 0 | 298 |
| Mecosta | 0 | 0 | 0 | 0 | 1,724 | 0 | 0 | 0 | 31 | 10,750 | 0 | 0 |
| Midland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 4,509 | 0 | 0 |
| Missaukee | 0 | 0 | 0 | 726 | 0 | 0 | 0 | 0 | 41 | 13,845 | 0 | 104 |
| Montmorency | 0 | 198 | 0 | 3,099 | 544 | 0 | 211 | 0 | 677 | 19,147 | 535 | 130 |
| Newaygo | 0 | 0 | 0 | 0 | 9,280 | 0 | 0 | 0 | 73 | 19,955 | 0 | 0 |
| Oceana | 0 | 0 | 0 | 0 | 5,861 | 0 | 0 | 0 | 104 | 6,383 | 0 | 156 |
| Ogemaw | 0 | 0 | 0 | 7,960 | 0 | 0 | 0 | 0 | 394 | 9,345 | 125 | 9 |
| Osceola | 0 | 0 | 0 | 0 | 332 | 0 | 0 | 0 | 66 | 15,384 | 0 | 52 |
| Oscoda | 0 | 662 | 198 | 15,037 | 212 | 100 | 108 | 0 | 365 | 24,243 | 543 | 65 |
| Otsego | 0 | 87 | 133 | 3,869 | 969 | 43 | 0 | 0 | 116 | 8,660 | 25 | 16 |
| Presque Isle | 0 | 2,342 | 44 | 2,148 | 293 | 0 | 992 | 0 | 926 | 23,788 | 1,017 | 164 |
| Roscommon | 0 | 425 | 0 | 3,369 | 0 | 0 | 0 | 0 | 112 | 10,906 | 28 | 52 |
| Wexford | 0 | 0 | 0 | 4,362 | 4,362 | 0 | 0 | 0 | 232 | 10,354 | 0 | 208 |
| Total | 0 | 4,969 | 375 | 83,368 | 33,895 | 143 | 1,505 | 0 | 6,325 | 349,470 | 5,102 | 2,378 |
| S. Lower Peninsula | | | | | | | | | | | | |
| Allegan | 0 | 0 | 0 | 0 | 1,068 | 0 | 0 | 0 | 0 | 2,513 | 0 | 0 |
| Barry | 0 | 0 | 0 | 0 | 753 | 0 | 0 | 0 | 10 | 1,073 | 0 | 0 |
| Berrien | 0 | 0 | 0 | 0 | 228 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Calhoun | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cass | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Clinton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 0 |
| Eaton | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kalamazoo | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 49 | 0 | 0 |
| Kent | 0 | 0 | 0 | 0 | 754 | 0 | 0 | 0 | 0 | 79 | 0 | 0 |
| Montcalm | 0 | 0 | 0 | 0 | 555 | 0 | 0 | 0 | 42 | 5,111 | 0 | 0 |
| Muskegon | 0 | 0 | 0 | 0 | 3,614 | 0 | 0 | 0 | 46 | 2,734 | 0 | 0 |
| Ottawa | 0 | 0 | 0 | 0 | 10,170 | 0 | 0 | 0 | 6 | 32 | 0 | 0 |
| St. Joseph | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tuscola | 0 | 0 | 0 | 0 | 146 | 0 | 0 | 0 | 0 | 149 | 0 | 0 |
| Van Buren | 0 | 0 | 0 | 0 | 308 | 0 | 0 | 0 | 0 | 298 | 0 | 0 |
| Washtenaw | 0 | 0 | 0 | 0 | 486 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 18,397 | 0 | 0 | 0 | 104 | 12,085 | 0 | 0 |
| State total | 11,304 | 103,690 | 38,825 | 137,597 | 79,031 | 20,121 | 44,706 | 5,720 | 14,683 | 652,296 | 30,299 | 19,557 |

(Table 9 continued on next page)

| Unit and county[1/] | Beech | White birch | Yellow birch | Cotton-wood | Elm | Hickory | Hard maple | Soft maple | Red oak | White oak | Other hard-woods | All species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E. Upper Peninsula | | | | | | | | | | | | |
| Alger | 2,548 | 3,311 | 1,860 | 0 | 2,378 | 0 | 6,751 | 4,316 | 596 | 77 | 203 | 44,616 |
| Chippewa | 643 | 1,566 | 738 | 0 | 638 | 0 | 1,731 | 1,477 | 164 | 0 | 92 | 34,397 |
| Delta | 1,028 | 6,485 | 2,866 | 0 | 2,837 | 0 | 5,416 | 5,626 | 683 | 17 | 335 | 100,065 |
| Luce | 568 | 965 | 168 | 0 | 513 | 0 | 1,230 | 1,301 | 112 | 0 | 62 | 23,445 |
| Mackinac | 1,120 | 2,202 | 443 | 0 | 862 | 0 | 2,441 | 2,650 | 0 | 0 | 123 | 35,315 |
| Menominee | 437 | 7,908 | 1,605 | 0 | 4,044 | 0 | 9,209 | 10,846 | 1,429 | 179 | 468 | 112,772 |
| Schoolcraft | 1,581 | 5,383 | 478 | 0 | 2,355 | 0 | 3,354 | 7,445 | 683 | 101 | 460 | 63,034 |
| Total | 7,925 | 27,820 | 8,158 | 0 | 13,627 | 0 | 30,132 | 33,661 | 3,667 | 374 | 1,743 | 413,644 |
| W. Upper Peninsula | | | | | | | | | | | | |
| Baraga | 0 | 1,427 | 2,461 | 0 | 2,893 | 0 | 7,325 | 3,052 | 190 | 16 | 527 | 40,875 |
| Dickinson | 0 | 4,281 | 691 | 0 | 2,225 | 0 | 4,014 | 4,488 | 359 | 10 | 321 | 66,584 |
| Gogebic | 0 | 348 | 2,240 | 0 | 2,211 | 0 | 5,011 | 1,668 | 12 | 0 | 421 | 27,283 |
| Houghton | 0 | 1,336 | 973 | 0 | 1,080 | 0 | 2,493 | 1,491 | 101 | 18 | 175 | 26,132 |
| Iron | 0 | 4,445 | 5,911 | 0 | 6,841 | 0 | 17,242 | 9,069 | 1,240 | 294 | 1,498 | 140,807 |
| Keweenaw | 0 | 0 | 4 | 0 | 4 | 0 | 8 | 3 | 0 | 0 | 1 | 361 |
| Marquette | 0 | 13,539 | 2,389 | 0 | 4,740 | 0 | 10,219 | 13,311 | 1,177 | 79 | 962 | 144,993 |
| Ontonagon | 0 | 1,245 | 2,320 | 0 | 2,404 | 0 | 9,458 | 1,821 | 27 | 2 | 144 | 70,396 |
| Total | 0 | 26,621 | 16,989 | 0 | 22,398 | 0 | 55,770 | 34,903 | 3,106 | 419 | 4,049 | 517,431 |
| N. Lower Peninsula | | | | | | | | | | | | |
| Alcona | 57 | 2,350 | 0 | 0 | 0 | 0 | 154 | 3,398 | 4,984 | 660 | 32 | 44,454 |
| Alpena | 86 | 1,210 | 0 | 0 | 0 | 0 | 239 | 2,746 | 3,103 | 414 | 0 | 27,062 |
| Antrim | 4 | 14 | 0 | 0 | 2 | 0 | 34 | 391 | 0 | 0 | 1 | 1,231 |
| Arenac | 30 | 80 | 0 | 0 | 0 | 0 | 83 | 650 | 0 | 0 | 0 | 1,914 |
| Benzie | 179 | 327 | 0 | 0 | 0 | 0 | 414 | 4,080 | 1,927 | 283 | 146 | 14,287 |
| Charlevoix | 87 | 924 | 0 | 0 | 19 | 0 | 604 | 761 | 147 | 0 | 6 | 6,983 |
| Cheboygan | 380 | 2,934 | 0 | 0 | 89 | 0 | 2,389 | 4,131 | 963 | 4 | 4 | 38,076 |
| Clare | 0 | 210 | 0 | 0 | 0 | 0 | 2 | 263 | 1,333 | 434 | 0 | 12,057 |
| Crawford | 72 | 102 | 0 | 0 | 3 | 0 | 251 | 833 | 834 | 0 | 19 | 27,207 |
| Emmet | 173 | 461 | 0 | 0 | 7 | 0 | 767 | 1,089 | 272 | 0 | 70 | 10,504 |
| Gladwin | 0 | 199 | 0 | 0 | 0 | 0 | 2 | 61 | 286 | 13 | 0 | 4,229 |
| Grand Traverse | 208 | 177 | 0 | 0 | 0 | 0 | 208 | 416 | 312 | 104 | 104 | 6,244 |
| Iosco | 30 | 648 | 0 | 0 | 17 | 0 | 127 | 1,807 | 1,853 | 177 | 59 | 19,254 |
| Isabella | 1,118 | 0 | 0 | 0 | 0 | 0 | 0 | 1,242 | 12 | 1,118 | 0 | 14,935 |
| Kalkaska | 62 | 254 | 0 | 0 | 9 | 0 | 243 | 934 | 790 | 156 | 69 | 10,356 |
| Lake | 75 | 359 | 0 | 0 | 0 | 0 | 282 | 3,429 | 10,654 | 1,158 | 146 | 39,531 |
| Leelanau | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 1,021 |
| Manistee | 271 | 979 | 0 | 0 | 0 | 0 | 460 | 8,834 | 8,564 | 504 | 208 | 35,944 |
| Mason | 216 | 792 | 0 | 0 | 0 | 0 | 375 | 7,135 | 5,915 | 506 | 187 | 31,524 |
| Mecosta | 0 | 194 | 0 | 0 | 0 | 0 | 41 | 876 | 1,886 | 419 | 0 | 15,921 |
| Midland | 0 | 1,125 | 0 | 0 | 0 | 0 | 0 | 699 | 0 | 0 | 0 | 6,339 |
| Missaukee | 210 | 1,189 | 0 | 0 | 0 | 0 | 222 | 2,425 | 2,411 | 104 | 106 | 21,383 |
| Montmorency | 179 | 2,376 | 0 | 0 | 22 | 0 | 1,111 | 3,788 | 2,442 | 73 | 49 | 34,581 |
| Newaygo | 0 | 171 | 0 | 0 | 0 | 0 | 97 | 1,314 | 6,298 | 5,323 | 0 | 42,511 |
| Oceana | 37 | 239 | 0 | 0 | 0 | 0 | 158 | 1,093 | 3,428 | 707 | 42 | 18,208 |
| Ogemaw | 45 | 620 | 0 | 0 | 11 | 0 | 235 | 1,502 | 2,263 | 133 | 67 | 22,709 |
| Osceola | 52 | 768 | 0 | 0 | 0 | 0 | 70 | 924 | 4,804 | 554 | 34 | 23,040 |
| Oscoda | 137 | 1,313 | 0 | 0 | 0 | 0 | 462 | 2,493 | 3,506 | 312 | 119 | 49,875 |
| Otsego | 125 | 822 | 0 | 0 | 49 | 0 | 1,221 | 1,932 | 1,004 | 0 | 34 | 19,105 |
| Presque Isle | 113 | 3,783 | 0 | 0 | 32 | 0 | 555 | 3,216 | 534 | 8 | 0 | 39,955 |
| Roscommon | 55 | 601 | 0 | 0 | 0 | 0 | 10 | 483 | 2,483 | 83 | 62 | 18,669 |
| Wexford | 583 | 338 | 0 | 0 | 22 | 0 | 1,878 | 5,406 | 5,293 | 277 | 282 | 33,597 |
| Total | 4,584 | 25,574 | 0 | 0 | 282 | 0 | 12,694 | 68,351 | 78,321 | 13,524 | 1,846 | 692,706 |
| S. Lower Peninsula | | | | | | | | | | | | |
| Allegan | 0 | 0 | 0 | 391 | 0 | 0 | 341 | 967 | 0 | 7,190 | 0 | 12,470 |
| Barry | 0 | 10 | 0 | 0 | 0 | 0 | 13 | 64 | 450 | 96 | 0 | 2,469 |
| Berrien | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 228 |
| Calhoun | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| Cass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| Clinton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| Eaton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |
| Kalamazoo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 215 |
| Kent | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 833 |
| Montcalm | 0 | 42 | 0 | 0 | 0 | 0 | 56 | 481 | 1,975 | 816 | 0 | 9,078 |
| Muskegon | 0 | 46 | 0 | 0 | 0 | 0 | 61 | 305 | 2,139 | 459 | 0 | 9,404 |
| Ottawa | 0 | 6 | 0 | 0 | 0 | 0 | 8 | 41 | 306 | 61 | 0 | 10,630 |
| St. Joseph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| Tuscola | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 295 |
| Van Buren | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 488 | 0 | 440 | 0 | 1,534 |
| Washtenaw | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 486 |
| Total | 0 | 104 | 0 | 391 | 0 | 0 | 479 | 2,346 | 4,870 | 9,062 | 0 | 47,838 |
| State total | 12,509 | 80,119 | 25,147 | 391 | 36,307 | 0 | 99,075 | 139,261 | 89,964 | 23,379 | 7,638 | 1,671,619 |

(Table 9 continued on next page)

(Table 9 continued)

MINNESOTA

| Unit and county[1/] | Cedar | Balsam fir | Hemlock | Jack pine | Red pine | White pine | Spruce | Tamarack | Ash | Aspen | Balsam poplar | Basswood |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aspen-Birch | | | | | | | | | | | | |
| Carlton | 0 | 910 | 0 | 333 | 370 | 37 | 801 | 439 | 0 | 13,871 | 2,498 | 0 |
| Cook | 0 | 20,294 | 0 | 3,531 | 1 | 0 | 14,015 | 0 | 0 | 20,037 | 580 | 0 |
| Koochiching | 0 | 16,764 | 0 | 17,476 | 2,751 | 1,422 | 42,704 | 9,189 | 62 | 103,085 | 9,440 | 0 |
| Lake | 0 | 5,046 | 0 | 4,134 | 1,144 | 1,916 | 13,549 | 271 | 0 | 29,704 | 489 | 0 |
| St. Louis | 0 | 26,252 | 0 | 24,634 | 6,916 | 5,914 | 21,786 | 1,500 | 21 | 185,033 | 17,480 | 0 |
| Total | 0 | 69,266 | 0 | 50,108 | 11,182 | 9,289 | 92,855 | 11,399 | 83 | 351,730 | 30,487 | 0 |
| Northern Pine | | | | | | | | | | | | |
| Aitkin | 0 | 853 | 0 | 305 | 339 | 34 | 414 | 2,198 | 0 | 37,036 | 4,580 | 0 |
| Becker | 0 | 0 | 0 | 1,688 | 307 | 41 | 0 | 0 | 0 | 1,433 | 60 | 0 |
| Beltrami | 0 | 7,196 | 0 | 9,231 | 1,784 | 331 | 9,696 | 7,757 | 57 | 59,868 | 2,968 | 99 |
| Cass | 0 | 1,896 | 0 | 13,176 | 2,181 | 427 | 530 | 1,033 | 32 | 70,810 | 1,072 | 0 |
| Clearwater | 0 | 1,066 | 0 | 1,528 | 416 | 76 | 2,098 | 2,303 | 21 | 17,893 | 808 | 47 |
| Crow Wing | 0 | 0 | 0 | 6,075 | 631 | 22 | 0 | 0 | 6 | 8,438 | 0 | 0 |
| Hubbard | 0 | 666 | 0 | 2,844 | 308 | 82 | 779 | 493 | 0 | 48,604 | 2,130 | 57 |
| Itasca | 0 | 19,384 | 0 | 8,270 | 1,430 | 456 | 7,213 | 3,027 | 21 | 166,731 | 6,143 | 21 |
| Lake of the Woods | 0 | 390 | 0 | 5,407 | 170 | 37 | 10,453 | 540 | 0 | 5,301 | 430 | 0 |
| Mahnomen | 0 | 0 | 0 | 164 | 31 | 10 | 0 | 0 | 0 | 2,307 | 172 | 5 |
| Roseau | 0 | 26 | 0 | 1,976 | 62 | 21 | 3,136 | 314 | 0 | 1,521 | 210 | 0 |
| Wadena | 0 | 0 | 0 | 8,652 | 1,092 | 184 | 0 | 0 | 0 | 2,120 | 122 | 0 |
| Total | 0 | 31,477 | 0 | 59,316 | 8,751 | 1,721 | 34,319 | 17,665 | 137 | 422,062 | 18,695 | 229 |
| Central Hardwood | | | | | | | | | | | | |
| Chisago | 0 | 0 | 0 | 124 | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Goodhue | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isanti | 0 | 0 | 0 | 0 | 337 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kanabec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,380 | 0 | 0 |
| Mille Lacs | 0 | 0 | 0 | 189 | 21 | 0 | 116 | 152 | 0 | 2,561 | 0 | 2 |
| Morrison | 0 | 0 | 0 | 189 | 21 | 0 | 14 | 0 | 0 | 9,001 | 0 | 0 |
| Otter Tail | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 205 | 0 | 0 |
| Pine | 0 | 0 | 0 | 472 | 689 | 52 | 0 | 0 | 0 | 12,829 | 2,498 | 0 |
| Scott | 0 | 0 | 0 | 119 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sherburne | 0 | 0 | 0 | 364 | 2,970 | 25 | 0 | 0 | 0 | 0 | 0 | 0 |
| Todd | 0 | 0 | 0 | 250 | 44 | 0 | 0 | 0 | 0 | 205 | 0 | 0 |
| Wabasha | 0 | 0 | 0 | 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 1,839 | 4,297 | 77 | 130 | 159 | 0 | 27,181 | 2,498 | 2 |
| Prairie | | | | | | | | | | | | |
| Cottonwood | 0 | 0 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kandiyohi | 0 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Polk | 0 | 0 | 0 | 0 | 0 | 0 | 114 | 730 | 0 | 356 | 0 | 0 |
| Red Lake | 0 | 0 | 0 | 105 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 184 | 145 | 0 | 114 | 730 | 0 | 356 | 0 | 0 |
| State total | 0 | 100,743 | 0 | 111,447 | 24,375 | 11,087 | 127,418 | 29,953 | 220 | 801,329 | 51,680 | 231 |

| Unit and county[1/] | Beech | White birch | Yellow birch | Cottonwood | Elm | Hickory | Hard maple | Soft maple | Red oak | White oak | Other hardwoods | All species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aspen-Birch | | | | | | | | | | | | |
| Carlton | 0 | 162 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19,421 |
| Cook | 0 | 138 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58,596 |
| Koochiching | 0 | 554 | 0 | 0 | 0 | 0 | 312 | 0 | 0 | 0 | 0 | 203,759 |
| Lake | 0 | 3,795 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60,048 |
| St. Louis | 0 | 4,019 | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 293,614 |
| Total | 0 | 8,668 | 0 | 0 | 0 | 0 | 371 | 0 | 0 | 0 | 0 | 635,438 |
| Northern Pine | | | | | | | | | | | | |
| Aitkin | 0 | 216 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45,975 |
| Becker | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,529 |
| Beltrami | 0 | 981 | 0 | 0 | 10 | 0 | 107 | 2 | 0 | 0 | 0 | 100,087 |
| Cass | 0 | 358 | 0 | 0 | 24 | 0 | 31 | 10 | 20 | 8 | 0 | 91,608 |
| Clearwater | 0 | 200 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 26,508 |
| Crow Wing | 0 | 19 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 15,196 |
| Hubbard | 0 | 182 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56,145 |
| Itasca | 0 | 351 | 0 | 0 | 0 | 0 | 104 | 0 | 0 | 0 | 0 | 213,151 |
| Lake of the Woods | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22,728 |
| Mahnomen | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,705 |
| Roseau | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,266 |
| Wadena | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12,170 |
| Total | 0 | 2,323 | 0 | 0 | 35 | 0 | 296 | 14 | 20 | 8 | 0 | 597,068 |
| Central Hardwood | | | | | | | | | | | | |
| Chisago | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 315 |
| Goodhue | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| Isanti | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 337 |
| Kanabec | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,380 |
| Mille Lacs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,041 |
| Morrison | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9,225 |
| Otter Tail | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 212 |
| Pine | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16,680 |
| Scott | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 119 |
| Sherburne | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,359 |
| Todd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 499 |
| Wabasha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 |
| Total | 0 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36,323 |
| Prairie | | | | | | | | | | | | |
| Cottonwood | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 120 |
| Kandiyohi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 79 |
| Polk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,200 |
| Red Lake | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 130 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,529 |
| State total | 0 | 11,131 | 0 | 0 | 35 | 0 | 667 | 14 | 20 | 8 | 0 | 1,270,358 |

(Table 9 continued on next page)

(Table 9 continued)

WISCONSIN

| Unit and county[1] | Cedar | Balsam fir | Hemlock | Jack pine | Red pine | White pine | Spruce | Tamarack | Ash | Aspen | Balsam poplar | Basswood |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northeastern | | | | | | | | | | | | |
| Florence | 0 | 5,348 | 820 | 1,169 | 2,427 | 327 | 1,843 | 178 | 434 | 32,619 | 0 | 92 |
| Forest | 0 | 22,692 | 2,189 | 780 | 5,812 | 72 | 7,187 | 146 | 1,878 | 49,861 | 0 | 1,520 |
| Langlade | 0 | 6,645 | 303 | 227 | 2,718 | 25 | 1,083 | 137 | 2,168 | 41,051 | 0 | 1,297 |
| Lincoln | 0 | 3,558 | 629 | 1,588 | 4,132 | 1,460 | 901 | 257 | 3,663 | 46,960 | 0 | 3,761 |
| Marinette | 0 | 11,585 | 1,212 | 17,491 | 11,137 | 543 | 3,911 | 121 | 1,538 | 88,291 | 0 | 143 |
| Menominee | 0 | 0 | 16,338 | 2,976 | 300 | 38 | 11 | 0 | 526 | 20,941 | 0 | 0 |
| Oconto | 0 | 1,569 | 705 | 11,027 | 10,267 | 269 | 393 | 0 | 385 | 23,606 | 0 | 62 |
| Oneida | 0 | 20,710 | 687 | 6,255 | 8,920 | 1,905 | 4,196 | 524 | 2,196 | 63,489 | 0 | 1,416 |
| Shawano | 0 | 108 | 521 | 1,272 | 5,734 | 113 | 0 | 42 | 329 | 11,990 | 0 | 14 |
| Vilas | 0 | 6,724 | 787 | 5,675 | 4,397 | 1,698 | 1,942 | 18 | 618 | 36,447 | 0 | 555 |
| Total | 0 | 78,939 | 24,191 | 48,460 | 55,844 | 6,450 | 21,467 | 1,423 | 13,735 | 415,255 | 0 | 8,860 |
| Northwestern | | | | | | | | | | | | |
| Ashland | 0 | 9,713 | 544 | 2,442 | 8,415 | 812 | 2,271 | 335 | 2,176 | 42,407 | 0 | 216 |
| Barron | 0 | 0 | 0 | 77 | 90 | 77 | 0 | 0 | 33 | 1,146 | 0 | 5 |
| Bayfield | 0 | 1,233 | 379 | 15,398 | 4,435 | 1,100 | 228 | 54 | 1,536 | 84,192 | 416 | 2 |
| Burnett | 0 | 22 | 0 | 19,209 | 2,472 | 20 | 7 | 42 | 40 | 26,783 | 0 | 0 |
| Douglas | 0 | 490 | 0 | 37,507 | 9,527 | 146 | 40 | 0 | 165 | 64,260 | 208 | 0 |
| Iron | 0 | 1,177 | 276 | 289 | 180 | 338 | 118 | 24 | 1,419 | 37,539 | 0 | 531 |
| Polk | 0 | 10 | 0 | 1,928 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Price | 0 | 4,719 | 650 | 1,170 | 2,323 | 161 | 1,393 | 1,067 | 5,505 | 37,793 | 0 | 1,182 |
| Rusk | 0 | 12 | 191 | 409 | 575 | 23 | 0 | 96 | 3,575 | 35,230 | 0 | 2,592 |
| Sawyer | 0 | 4,548 | 661 | 3,304 | 3,554 | 311 | 688 | 659 | 2,445 | 75,203 | 0 | 946 |
| Taylor | 0 | 2,211 | 997 | 812 | 1,399 | 0 | 310 | 325 | 2,650 | 30,810 | 0 | 599 |
| Washburn | 0 | 1,151 | 0 | 9,416 | 2,821 | 647 | 303 | 37 | 604 | 33,897 | 0 | 0 |
| Total | 0 | 25,286 | 3,698 | 91,961 | 35,791 | 3,635 | 5,358 | 2,639 | 20,148 | 469,260 | 624 | 6,073 |
| Central | | | | | | | | | | | | |
| Adams | 0 | 0 | 0 | 14,586 | 21,948 | 1,329 | 0 | 0 | 52 | 438 | 0 | 0 |
| Chippewa | 0 | 0 | 149 | 1,354 | 878 | 0 | 0 | 121 | 862 | 12,669 | 0 | 546 |
| Clark | 0 | 0 | 246 | 3,083 | 1,599 | 29 | 33 | 0 | 708 | 20,317 | 0 | 28 |
| Eau Claire | 0 | 0 | 0 | 8,870 | 3,792 | 273 | 8 | 0 | 167 | 2,406 | 0 | 14 |
| Jackson | 0 | 0 | 0 | 11,741 | 4,122 | 339 | 0 | 10 | 150 | 2,911 | 0 | 0 |
| Juneau | 0 | 0 | 0 | 12,815 | 6,218 | 1,444 | 0 | 0 | 145 | 1,742 | 0 | 0 |
| Marathon | 0 | 461 | 547 | 815 | 3,988 | 236 | 356 | 31 | 658 | 21,988 | 0 | 49 |
| Marquette | 0 | 0 | 0 | 1,370 | 2,582 | 102 | 0 | 26 | 0 | 415 | 0 | 0 |
| Monroe | 0 | 0 | 0 | 6,830 | 2,613 | 200 | 0 | 0 | 146 | 875 | 0 | 0 |
| Portage | 0 | 23 | 97 | 4,034 | 4,411 | 1,611 | 11 | 707 | 66 | 4,409 | 0 | 24 |
| Waupaca | 0 | 40 | 4 | 1,103 | 5,890 | 983 | 9 | 14 | 117 | 3,228 | 0 | 21 |
| Waushara | 0 | 0 | 0 | 2,004 | 10,116 | 1,304 | 0 | 0 | 0 | 46 | 0 | 0 |
| Wood | 0 | 0 | 0 | 2,516 | 1,478 | 1,637 | 62 | 9 | 370 | 8,138 | 0 | 0 |
| Total | 0 | 524 | 1,043 | 71,121 | 69,635 | 9,487 | 479 | 918 | 3,441 | 79,582 | 0 | 682 |
| Southwestern | | | | | | | | | | | | |
| Buffalo | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Crawford | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 190 | 0 | 75 |
| Dunn | 0 | 29 | 0 | 3,233 | 8,120 | 1,159 | 11 | 0 | 3 | 75 | 0 | 0 |
| Grant | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 180 | 0 | 74 |
| Lacrosse | 0 | 0 | 0 | 52 | 277 | 0 | 0 | 0 | 3 | 53 | 0 | 0 |
| Pepin | 0 | 0 | 0 | 108 | 111 | 11 | 23 | 0 | 0 | 0 | 0 | 0 |
| Pierce | 0 | 0 | 0 | 0 | 21 | 31 | 0 | 0 | 0 | 11 | 0 | 0 |
| Sauk | 0 | 0 | 0 | 1,625 | 3,230 | 233 | 0 | 0 | 33 | 0 | 0 | 0 |
| Trempealeau | 0 | 0 | 0 | 169 | 1,851 | 122 | 0 | 0 | 2 | 0 | 0 | 0 |
| Vernon | 0 | 0 | 0 | 14 | 16 | 28 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 29 | 0 | 5,243 | 13,626 | 1,584 | 34 | 0 | 121 | 509 | 0 | 149 |
| Southeastern | | | | | | | | | | | | |
| Brown | 0 | 0 | 0 | 0 | 488 | 0 | 0 | 0 | 0 | 306 | 0 | 0 |
| Columbia | 0 | 0 | 0 | 285 | 3,912 | 122 | 0 | 0 | 130 | 59 | 0 | 0 |
| Door | 0 | 0 | 0 | 12 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Green Lake | 0 | 0 | 0 | 15 | 152 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kenosha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 |
| Kewaunee | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Outagamie | 0 | 0 | 0 | 19 | 96 | 24 | 0 | 0 | 0 | 153 | 0 | 0 |
| Rock | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Walworth | 0 | 0 | 0 | 0 | 1,096 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| Waukesha | 0 | 0 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 331 | 5,982 | 190 | 0 | 0 | 132 | 543 | 0 | 0 |
| State total | 0 | 104,778 | 28,932 | 217,116 | 180,878 | 21,346 | 27,338 | 4,980 | 37,577 | 965,149 | 624 | 15,764 |

(Table 9 continued on next page)

(Table 9 continued) WISCONSIN

| Unit and county[1] | Beech | White birch | Yellow birch | Cotton-wood | Elm | Hickory | Hard maple | Soft maple | Red oak | White oak | Other hard-woods | All species |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northeastern | | | | | | | | | | | | |
| Florence | 0 | 3,166 | 886 | 0 | 1,410 | 0 | 3,480 | 1,288 | 646 | 156 | 53 | 56,342 |
| Forest | 2 | 9,493 | 1,861 | 0 | 4,986 | 0 | 12,631 | 4,697 | 1,233 | 345 | 609 | 127,994 |
| Langlade | 0 | 4,449 | 1,904 | 0 | 3,948 | 71 | 12,589 | 3,775 | 792 | 64 | 697 | 83,943 |
| Lincoln | 0 | 5,664 | 1,290 | 0 | 2,524 | 0 | 6,933 | 4,937 | 2,024 | 1 | 234 | 90,516 |
| Marinette | 25 | 7,306 | 248 | 0 | 2,264 | 0 | 4,729 | 4,844 | 3,074 | 774 | 141 | 159,377 |
| Menominee | 0 | 401 | 494 | 0 | 2,748 | 146 | 2,439 | 2,879 | 678 | 200 | 146 | 51,261 |
| Oconto | 0 | 2,610 | 52 | 0 | 512 | 0 | 1,097 | 864 | 471 | 123 | 29 | 54,041 |
| Oneida | 0 | 17,590 | 1,794 | 0 | 744 | 0 | 7,500 | 4,709 | 3,854 | 208 | 450 | 147,147 |
| Shawano | 0 | 435 | 343 | 0 | 2,460 | 246 | 2,266 | 897 | 827 | 97 | 165 | 27,859 |
| Vilas | 0 | 12,787 | 960 | 0 | 445 | 0 | 4,800 | 1,512 | 1,706 | 253 | 56 | 81,380 |
| Total | 27 | 63,901 | 9,832 | 0 | 22,041 | 463 | 58,464 | 30,402 | 15,305 | 2,221 | 2580 | 879,860 |
| Northweastern | | | | | | | | | | | | |
| Ashland | 3 | 6,722 | 2,592 | 0 | 5,508 | 0 | 7,237 | 3,821 | 1,007 | 94 | 111 | 96,426 |
| Barron | 0 | 255 | 11 | 0 | 17 | 0 | 77 | 56 | 64 | 14 | 2 | 1,924 |
| Bayfield | 0 | 10,046 | 2,629 | 0 | 5,753 | 0 | 5,370 | 2,119 | 1,133 | 28 | 12 | 136,063 |
| Burnett | 0 | 258 | 0 | 0 | 173 | 0 | 408 | 293 | 120 | 41 | 0 | 49,888 |
| Douglas | 0 | 3,197 | 37 | 0 | 114 | 0 | 266 | 118 | 10 | 2 | 8 | 116,095 |
| Iron | 0 | 3,339 | 1,328 | 0 | 2,522 | 0 | 3,689 | 1,641 | 770 | 120 | 49 | 55,349 |
| Polk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,938 |
| Price | 0 | 12,345 | 3,521 | 0 | 17,135 | 0 | 12,049 | 5,917 | 3,055 | 645 | 166 | 110,796 |
| Rusk | 0 | 6,505 | 1,429 | 0 | 1,154 | 0 | 6,219 | 3,812 | 3,190 | 657 | 163 | 65,832 |
| Sawyer | 0 | 8,591 | 1,187 | 0 | 894 | 0 | 7,700 | 2,876 | 1,142 | 216 | 269 | 115,194 |
| Taylor | 0 | 3,608 | 2,726 | 0 | 6,524 | 0 | 7,381 | 3,941 | 1,064 | 301 | 37 | 65,695 |
| Washburn | 0 | 2,495 | 141 | 0 | 471 | 0 | 1,321 | 860 | 532 | 124 | 32 | 54,852 |
| Total | 3 | 57,361 | 15,601 | 0 | 40,265 | 0 | 51,717 | 25,454 | 12,087 | 2,242 | 849 | 870,052 |
| Central | | | | | | | | | | | | |
| Adams | 0 | 104 | 32 | 0 | 359 | 0 | 157 | 456 | 4,738 | 1,824 | 0 | 46,023 |
| Chippewa | 0 | 2,332 | 802 | 0 | 1,046 | 0 | 1,405 | 1,363 | 1,485 | 561 | 26 | 25,599 |
| Clark | 1 | 2,608 | 638 | 0 | 1,485 | 0 | 1,541 | 996 | 4,925 | 2,580 | 33 | 40,850 |
| Eau Claire | 1 | 324 | 53 | 0 | 229 | 0 | 234 | 440 | 1,696 | 442 | 36 | 18,985 |
| Jackson | 1 | 407 | 47 | 0 | 271 | 0 | 174 | 445 | 4,543 | 1,428 | 30 | 26,619 |
| Juneau | 0 | 521 | 2 | 0 | 372 | 0 | 488 | 550 | 4,401 | 2,040 | 0 | 30,738 |
| Marathon | 0 | 1,447 | 995 | 0 | 2,907 | 39 | 2,336 | 1,359 | 3,231 | 206 | 30 | 41,679 |
| Marquette | 0 | 208 | 0 | 0 | 208 | 0 | 312 | 208 | 972 | 520 | 0 | 6,923 |
| Monroe | 0 | 293 | 8 | 0 | 333 | 0 | 433 | 469 | 1,136 | 345 | 2 | 13,683 |
| Portage | 0 | 216 | 24 | 0 | 80 | 0 | 183 | 192 | 1,283 | 822 | 6 | 18,199 |
| Waupaca | 0 | 125 | 26 | 0 | 222 | 14 | 275 | 315 | 582 | 157 | 16 | 13,141 |
| Waushara | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 53 | 0 | 0 | 13,535 |
| Wood | 0 | 400 | 118 | 0 | 335 | 0 | 293 | 351 | 2,387 | 800 | 6 | 18,900 |
| Total | 3 | 8,985 | 2,745 | 0 | 7,847 | 53 | 7,837 | 7,150 | 31,432 | 11,725 | 185 | 314,874 |
| Southwestern | | | | | | | | | | | | |
| Buffalo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 |
| Crawford | 0 | 61 | 0 | 14 | 141 | 0 | 71 | 91 | 533 | 202 | 18 | 1,437 |
| Dunn | 0 | 4 | 0 | 0 | 11 | 0 | 6 | 0 | 7 | 3 | 2 | 12,663 |
| Grant | 0 | 61 | 0 | 12 | 139 | 0 | 72 | 83 | 550 | 207 | 18 | 1,435 |
| Lacrosse | 0 | 3 | 0 | 0 | 8 | 0 | 4 | 7 | 0 | 0 | 2 | 409 |
| Pepin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 279 |
| Pierce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 |
| Sauk | 0 | 63 | 0 | 0 | 99 | 0 | 155 | 155 | 271 | 98 | 2 | 5,964 |
| Trempealeau | 0 | 14 | 0 | 0 | 8 | 0 | 5 | 5 | 59 | 23 | 2 | 2,260 |
| Vernon | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Total | 0 | 206 | 0 | 26 | 406 | 0 | 313 | 341 | 1,446 | 533 | 44 | 24,610 |
| Southeastern | | | | | | | | | | | | |
| Brown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 794 |
| Columbia | 12 | 208 | 4 | 0 | 175 | 0 | 176 | 113 | 553 | 267 | 46 | 6,062 |
| Door | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| Green Lake | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 200 |
| Kenosha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Kewaunee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| Outagamie | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 292 |
| Rock | 1 | 0 | 0 | 0 | 4 | 0 | 2 | 1 | 0 | 0 | 2 | 12 |
| Walworth | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,107 |
| Waukesha | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 186 |
| Total | 13 | 208 | 4 | 0 | 179 | 0 | 178 | 114 | 553 | 267 | 48 | 8,742 |
| State total | 46 | 130,661 | 28,182 | 26 | 70,738 | 516 | 118,509 | 63,461 | 60,823 | 16,988 | 3,706 | 2,098,138 |

[1] Includes only those counties that supplied pulpwood in 1981.

Table 10.--Central States pulpwood production by State and destination, 1977-1981.

(In thousand standard cords, unpeeled)

| | Illinois | | | Indiana | | | Iowa | | | Missouri | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Destination | | | Destination | | | Destination | | | Destination | |
| Year | Total | Central States | Other States | Total | Central States | Other States | Total | Central States | Other States | Total | Central States | Other States |
| 1977 | 111 | 53 | 58 | 161 | 66 | 95 | 50 | 46 | 4 | 123 | 44 | 79 |
| 1978 | 100 | 49 | 51 | 190 | 81 | 109 | 42 | 40 | 2 | 99 | 42 | 57 |
| 1979 | 102 | 52 | 50 | 204 | 89 | 115 | 69 | 56 | 13 | 101 | 42 | 59 |
| 1980 | 102 | 45 | 57 | 178 | 69 | 109 | 44 | 39 | 5 | 105 | 38 | 67 |
| 1981 | 100 | 43 | 57 | 185 | 68 | 117 | 32 | 26 | 6 | 111 | 44 | 67 |

Table 11.--Trends in receipts of roundwood and residue as pulpwood, Central States, 1977-1981

(In thousand standard cords, unpeeled)

| Type of material and Area | 1977 | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|---|
| Roundwood | | | | | |
| Illinois | 24 | 30 | 33 | 19 | 19 |
| Indiana, Iowa, Missouri | 62 | 70 | 96 | 75 | 60 |
| Total | 86 | 100 | 129 | 94 | 79 |
| Residue | | | | | |
| Illinois | 62 | 54 | 59 | 28 | 3 |
| Indiana, Iowa, Missouri | 98 | 95 | 107 | 99 | 112 |
| Total | 160 | 149 | 166 | 127 | 115 |
| All material | 246 | 249 | 295 | 221 | 194 |

U.S. GOVERNMENT PRINTING OFFICE:1983-666-762/5047

Blyth, James E.; Smith, W. Brad.
Pulpwood production in the North Central Region, by county, 1981. Resour. Bull. NC-69. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1983. 21 p.

Discusses 1981 production and receipts and recent production for other years in the Lake and Central States. Shows Michigan, Minnesota, and Wisconsin production by species for each county and compares production by Forest Inventory Unit with that of previous years. Presents 1980 production and receipt data for Illinois, Indiana, Iowa, and Missouri, and shows four production classes by county.

KEY WORDS: Roundwood, residue, receipts, Lake States, Central States.

**United States Department of Agriculture**

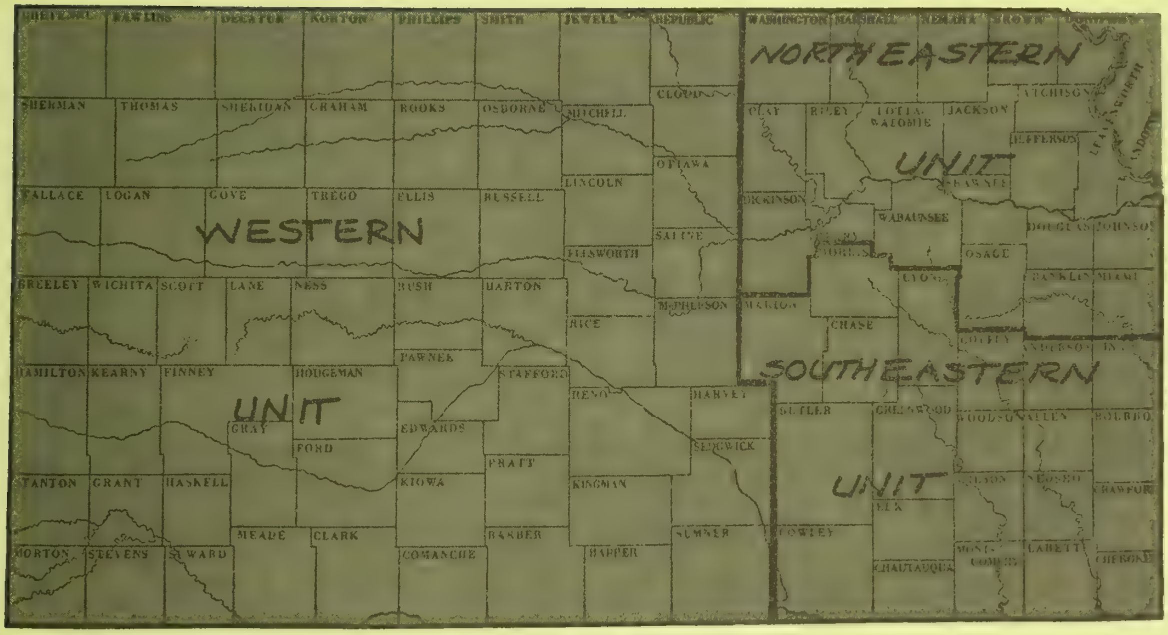
Forest Service

North Central Forest Experiment Station

Resource Bulletin **NC-70**

# Kansas Forest Statistics, 1981

Gerhard K. Raile and John S. Spencer, Jr.



North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
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Information contained in this report includes the most commonly used Forest Inventory and Analysis (FIA) statistics. However, additional forest resource data can be provided to interested users. Persons requesting additional information that can be provided from the raw inventory data are expected to pay for the retrieval costs. These costs will vary depending on the complexity of the request, from less than $100 for a relatively simple request to $2,000 for a complete retrieval involving the services of a FIA computer programmer. If requests for data conflict with ongoing work, requests will be scheduled so as to minimize the impact on the work unit.

Requests for unpublished information may be directed to:

Burton L. Essex
Forest Inventory and Analysis Project
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108

Phone: (612) 642-5282

Area served: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, Wisconsin.

# FOREWORD

Forest Inventory and Analysis is a continuing endeavor as mandated by the Forest and Rangeland Renewable Resources Planning Act of 1974, which was preceded by the McSweeney-McNary Forest Research Act of 1928. Its objective is to periodically inventory the Nation's forest land to determine its extent, condition, and volume of timber, growth, and depletions. This kind of up-to-date information is essential to frame intelligent forest policies and programs. USDA Forest Service regional experiment stations are responsible for conducting these inventories and publishing summary reports for individual States. The North Central Forest Experiment Station is responsible for Forest Inventory and Analysis work done in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, eastern South Dakota, and Wisconsin.

Fieldwork for the 1981 Kansas Forest Survey was begun in October, 1980, and was completed in July, 1981. Reports on the two previous surveys of Kansas' timber resources are dated 1936 and 1965.

More accurate and detailed survey information was obtained during the 1981 survey than otherwise would have been feasible because of intensified field sampling. This intensification was made possible through special funding requested by the Governor and appropriated by the 1980 Kansas legislature. This funding allowed State and Extension Forestry at Kansas State University to provide extra personnel for additional field sampling. State and Extension Forestry also assisted in a canvass of primary wood-using plants in the State, which was used to help estimate the quantity of timber products harvested in Kansas.

Aerial photos used in the Kansas forest inventory were provided by the USDA Agricultural Stabilization and Conservation Service.

# CONTENTS

*Page*

Highlights ........ 1
Appendix ........ 3
  Accuracy of Survey ........ 3
  Survey Procedure ........ 3
  Comparing Kansas' Third Survey with the Second Survey ........ 4
  Log Grade ........ 4
  Principal Tree Species Groups in Kansas ........ 7
  Metric Equivalents of Units used in this Report ........ 8
  Definition of Terms ........ 8
  Tables ........ 13

# KANSAS FOREST STATISTICS, 1981

**Gerhard K. Raile,** *Mensurationist,*
*and* **John S. Spencer, Jr.,** *Principal Resource Analyst*

## HIGHLIGHTS

### Area

- Forest land area totaled 1.4 million acres—2.6 percent of the State's total land area.

- Productive-reserved forest land increased from 900 acres in 1965 to 22,400 acres in 1981.

- Nine percent of the State's forest land is unproductive forest.

- Commercial forest land increased by 1.4 percent between 1965 and 1981,from 1,191,500 to 1,207,900 acres.

- Commercial forest land is concentrated in the Northeastern (588,100 acres) and the Southeastern (437,000 acres) Survey Units.

- Nonindustrial private parties own 96 percent of the State's commercial forest land—farmers alone own 62 percent.

- The elm-ash-cottonwood (289,600 acres), oak-hickory (316,600) and lowland plains hardwoods (265,900) forest types account for 72 percent of the commercial area.

- Sawtimber stands account for 47 percent of the commercial forest, followed by sapling and seedling stands (30 percent), poletimber stands (19 percent), and nonstocked areas (4 percent).

- Stands up to 20 years of age occupy 29 percent of the commercial forest.

- Forty-three percent of the commercial forest is poorly stocked with growing-stock trees (16.7 to 60 percent stocked), 45 percent is medium stocked (61 to 100 percent stocked), and 8 percent is well stocked (101 to 133 percent stocked).

- Windbreaks occupy 186,300 acres.

- Wooded strips amount to 150,000 acres and are part of the 1.2 million acres of nonforest land with trees in the State. Wooded strips do not include windbreaks and would be commercial forest except for width.

### Volume

- The total volume of timber in 1981 was 927.0 million cubic feet—711.3 million in growing-stock trees, 211.3 million in rough and rotten trees, and 4.4 million in salvable dead trees.

- Growing-stock volume in 1981 (711.3 million cubic feet) increased 42 percent from the 502.6 million cubic feet in 1965.

- Growing-stock volume per acre increased 40 percent from 422 cubic feet in 1965 to 589 cubic feet in 1981.

- Sawtimber volume on commercial forest land increased 31 percent from 1,953.5 million board feet in 1965 to 2,566.2 million board feet in 1981.

- Sawtimber volume per acre of commercial forest land increased 30 percent from 1,640 board feet in 1965 to 2,125 board feet in 1981.

- In addition to the sawtimber volume on commercial forest land, there were 147.9 million board feet in short-log trees, and 315.5 million board feet in sawtimber and short-log trees on wooded strips.

- Cottonwood accounts for the largest volume of growing stock on commercial forest land (19 percent), followed by hackberry (12 percent), ash (9 percent), bur oak (9 percent), and black walnut (8 percent).

- While nearly all species increased in volume between the two surveys, elm growing stock took a drastic drop due to Dutch elm disease—from 89.2 million cubic feet in 1965 to 30.6 million cubic feet in 1981. The drop in elm board foot volume was even more significant—from 358.3 million board feet in 1965 to 69.5 million board feet in 1981.

- Farmers own 427.2 million cubic feet of growing stock (60 percent of the total), and miscellaneous private parties own 243.2 million cubic feet (34 percent of the total).

- The lowland plains hardwoods type accounts for 25 percent of the growing-stock volume, the oak-hickory type for 27 percent, and the elm-ash-cottonwood type for 24 percent.

## Stand Conditions

- Net annual growth of growing stock amounted to 23.2 million cubic feet in 1980 (3.3 percent of inventory) compared to 22.1 million in 1964 (4.4 percent of inventory).

- Sawtimber growth was 64.0 million board feet in 1980, 2.5 percent of inventory.

- Mortality of growing-stock trees totaled 3.8 million cubic feet in 1980—0.5 percent of inventory.

- Disease accounts for 40 percent of the mortality volume—more than any other known cause.

- Sawtimber volume by butt log grade is fairly evenly divided between the best 3 grades of the 4 log grades used.

## Timber Use

- Timber removals from growing stock totaled 14.0 million cubic feet in 1980—12.1 million for roundwood products, 1.1 million for other removals, and 0.8 million for logging residue.

- Removals of growing stock in 1980 are 68 percent higher than those in 1964.

- Farmers and miscellaneous private individuals owned 99.9 percent of the 1980 growing-stock removals.

- Sawtimber removals from commercial forest land totaled 53.3 million board feet in 1980—77 percent higher than in 1964.

- Timber products output totaled 25.0 million cubic feet in 1980—76 percent as fuelwood and 20 percent as saw logs.

- Output of saw logs, veneer logs and cooperage from all sources totaled 32.7 million board feet in 1980—a 50 percent increase over 1964.

- Wood residue from primary plants amounted to 2.7 million cubic feet in 1980—one fourth of it was not used.

## Biomass

- Live tree biomass (trees greater than 1-inch in d.b.h.) totaled 53.3 million green tons (an average of 44 tons per acre) in 1981.

- Fifty-six percent of the live tree biomass is in the boles of trees greater than 5-inches d.b.h., 30 percent is in tops and limbs of trees greater than 5-inches d.b.h., and 14 percent is in trees less than 5-inches d.b.h.

- Highest yields per acre of live tree biomass (green weight) are in the cottonwood type (77 tons), the lowland plains hardwoods type (48 tons), the oak-hickory type (47 tons), and the post-blackjack oak type (46 tons)

# APPENDIX

## ACCURACY OF SURVEY

Forest Inventory and Analysis information is based on a sampling procedure designed to provide reliable statistics at the State and Survey Unit levels. Consequently, the reported figures are estimates only. However, a measure of reliability of these figures is given by sampling errors. These sampling errors mean that the chances are two out of three that if a 100-percent inventory had been taken, using the same methods, the results would have been within the limits indicated.

For example, the estimated area of commercial forest land in Kansas in 1981, 1,207,900 acres, has a sampling error of ±2.45 percent (±29,600 acres). The commercial forest area from a 100-percent inventory, then, would be expected to fall between 1,237,500 and 1,178,300 acres (1,207,900±29,600), there being a one in three chance that this is not the case.

The following tabulation shows sampling errors for State totals of information collected during the 1981 Kansas Forest Inventory:

| Item | Kansas totals | Sampling error |
|---|---|---|
| Growing stock | (Million cubic feet) | (Percent) |
| Volume | 711.3 | 3.52 |
| Growth | 26.2 | 5.61 |
| Removals | 14.0 | 17.00 |
| Sawtimber | (Million board feet) | |
| Volume | 2,566.2 | 4.24 |
| Growth | 80.8 | 6.44 |
| Removals | 53.2 | 20.10 |
| Commercial forest land | (Thousand acres) | |
| Area | 1,207.9 | 2.45 |

As survey data are broken down into sections smaller than State or Survey Unit totals, the sampling error increases. The smaller the breakdown, the larger the sampling error. For example, the sampling error for area of commercial forest land in a particular county is higher than that for total commercial forest area in the Survey Unit (table 102 shows the sampling errors for estimates smaller than State totals).

## SURVEY PROCEDURE

The major steps in the survey of Kansas were as follows:

1. A total of 275,271 1-acre points were systematically distributed across aerial photos of the entire State. Photo interpretors classified these points as forest land (9,570), nonforest land with trees (5,208), nonforest land without trees (258,420), questionable (424), and water (1,649) to make a preliminary estimate of forest area. Next, all of the forest points (9,570), 543 of the nonforest with tree points, and all of the questionable points (424) were stereoclassified as to forest type, stand-size class, and density. Then, 1,386 points classed as forest, 96 points classed as questionable, and 543 points classed as nonforest with trees were examined on the ground to correct the preliminary area estimate for errors in classification and for actual changes in land use since the photos were taken. At each of 937 locations classed as commercial forest, variable-radius plots (basal area factor 37.5) were established at 10 points uniformly placed over the sample acre. Two hundred twenty-two of these 937 locations were plots established during the 1965 survey and remeasured during the 1981 survey to provide improved growth and mortality information. Tree measurements made at commercial forest locations were the basis for estimates of timber volume, growth, mortality, number of trees, and other forest classifications.

2. An estimate of the volume of black walnut on nonforest land was made by establishing 10-point, variable-radius plots on nonforest ground check locations wherever black walnut trees were found. This included black walnut trees found on fence rows or as scattered trees but did not include walnut trees in urban areas, lawns, or in other areas where they would probably not be harvested.

3. An estimate of the volume of timber on nonforest wooded strips was made by establishing 10-point fixed-radius plots on wooded strip ground check locations. The design and size of these plots were adjusted to allow for the narrowness of the strips.

4. Growth and mortality on commercial forest land were estimated using data collected on both remeasurement plots (those established in 1965 and remeasured in 1981) and new plots established in 1981. On remeasurement plots growth was calculated as the observed change in volume on surviving trees. On new plots growth was estimated by using growth equations developed during the 1972 Missouri survey. Mortality on remeasurement plots was calculated as the observed volume in trees that died between surveys. And mortality on new plots was

estimated by determining the volume in trees that died within 3 years of plot establishment. Growth and mortality were converted to an annual basis.

5. Statistics on timber utilization during 1980 were obtained from mill surveys. State and Extension Forestry, Kansas State University canvassed resident sawmills and other primary wood-using plants. The North Central Forest Experiment Station canvassed out-of-State primary wood-using mills such as sawmills and veneer mills to determine their use of Kansas timber. State and Extension Forestry estimated 1980 fuelwood and post production from roundwood based on the best information available on recent output of these products. Estimates of primary mill residue used for fuelwood were obtained from the canvass of Kansas primary wood-using plants. Timber cut for products by ownership class was determined by a canvass of public and industrial timber owners. The portion of timber harvest unaccounted for by the latter owners was grouped under "farmer and other owners".

6. Wood utilization factors for converting timber products output to timber removals for saw logs, veneer logs, and cooperage logs were obtained during the 1971-1972 Missouri utilization study. Factors for fuelwood were obtained during the 1964 Kansas utilization study. Factors for all other products were obtained during the 1959-1960 Missouri utilization study.

7. Field data were sent to St. Paul, Minnesota, for processing and analysis.

## COMPARING KANSAS' THIRD SURVEY WITH THE SECOND SURVEY

Data from new forest surveys are often compared with data from earlier ones to determine trends in forest areas and volumes. Changes in procedures and definitions between surveys make it necessary to adjust earlier survey data so they are comparable to data from the new survey.

We adjusted the published 1965 area of commercial forest land, 1,192,400 acres, by subtracting 900 acres that were classed commercial forest in 1965 but were Christmas tree production areas (productive-reserved forest land) in 1981. The adjusted 1965 area (1,191,500 acres) can be compared directly with the 1981 area (1,207,900 acres).

A test was made to ensure that it was possible to move from the adjusted 1965 volumes to the new 1981 volumes by means of Timber Resource Analysis System (TRAS), a Forest Service computer program for updating, backdating, and projecting timber volume, growth, mortality, and removals. TRAS then recalculated 1965 volumes using 1981 estimates of cubic foot volume per tree and 1981 board foot-cubic foot ratios. This volume adjustment was necessary so that volume differences between surveys represented actual change and not merely change in the volume equations used on each occasion.

## LOG GRADE

In Kansas the butt log of every sawtimber tree was graded for quality on every full permanent sample plot, remeasurement plot, and nonforest plot with black walnut trees (4,194 trees). Logs were graded on the basis of external characteristics. Hardwood species were graded according to "Hardwood Log Grades for Standard Lumber".[1] The best 12-foot section of the lowest 16-foot hardwood log, or the best 12-foot upper section if the butt log did not meet minimum log-grade standards, was graded as follows:

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[1] *Vaughn, C. L.; Wollin, C. A.; McDonald, K. A.; Bulgrin, E. H. Hardwood log grades for standard lumber. Res. Pap. FPL 63, Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory; 1966. 52 p.*

# Forest Service standard grades for hardwood factory saw logs

| Grading factors | | Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Log grade 1 | | | Log grade 2 | | | | Log grade 3 |
| Position in tree | | Butts only | Butts and uppers | | Butts and uppers | | | | Butts and uppers |
| Scaling diameter, inches | | [1]13-15 | 16-19 | 20 + | [2]11 + | 12 + | | | 8 + |
| Length without trim, feet | | | 10 + | | 10 + | 8-9 | 10-11 | 12 + | 8 + |
| Required clear cuttings[3] of each of three best faces[4] | Min. length, feet | 7 | 5 | 3 | 3 | 3 | 3 | 3 | 2 |
| | Max. number | 2 | 2 | 2 | 2 | 2 | 2 | 3 | No Limit |
| | Min. proportion of log length required in clear cutting | 5/6 | 5/6 | 5/6 | 2/3 | 3/4 | 2/3 | 2/3 | 1/2 |
| Maximum sweep and crook allowance | For logs with less than one-fourth of end in sound defects | 15 percent | | | 30 percent | | | | 50 percent |
| | For logs with more than one-fourth of end in sound defects | 10 percent | | | 20 percent | | | | 35 percent |
| Maximum scaling deduction | | 40 percent[5] | | | 50 percent[6] | | | | 50 percent |

[1] Ash and basswood butts can be 12 inches if they otherwise meet requirements for small #1's.

[2] Ten-inch logs of all species can be #2's if they otherwise meet requirements for small #1's.

[3] A clear cutting is a portion of a face, extending the width of the face, that is free of defects.

[4] A face is one-fourth of the surface of the log as divided lengthwise.

[5] Otherwise #1 logs with 41-60 percent deductions can be #2.

[6] Otherwise #2 logs with 51-60 percent deductions can be #3.

# Forest Service standard specifications for hardwood construction logs (tie and timber logs)

| | | |
|---|---|---|
| Position in tree | | Butt and upper |
| Min. diameter, small end | | 8 inches + |
| Min. length, without trim | | 8 feet |
| Clear cuttings | | No requirements. |
| Sweep allowance, absolute | | One-fourth of the diameter at the small end for each 8 feet of length. |
| Sound surface defects | Single knots | Any number, if no one knot has an average diameter above the callus in excess of one-third of the log diameter at point of occurrence. |
| | Whorled knots | Any number if sum of knot diameters above the callus does not exceed one-third of the log diameter at point of occurrence. |
| | Holes | Any number provided none has a diameter over one-third of the log diameter at point of occurrence, and none extends more than 3 inches into included timber.[2] |
| Unsound surface defects | | Same requirements as for sound defects if they extend into included timber.[2] No limit if they do not. |
| End defects | Sound | No requirements. |
| | Unsound | None allowed; log must be sound internally, but will admit one shake not to exceed one-fourth the scaling diameter and will admit a longitudinal split not extending more than 5 inches into the contained timber. |

[1] These specifications are minimum for the class. If, from a group of logs, factory logs are selected first, thus leaving only non-factory logs from which to select construction logs, then the quality range of the construction logs so selected is limited, and the class may be considered a grade. If selection of construction logs is given first priority, then it may be necessary to subdivide the class into grades.

[2] Included timber is always square, and dimension is judged from small end.

Softwood species were graded according to the following specifications:

## Log Grades for Softwood Logs

### Grade 1

1. Logs must be 16 inches or larger, 10 feet or longer, and with deduction for defect not over 30 percent of gross scale.
2. Logs must be at least 75 percent clear on each of three faces.
3. All knots outside clear cutting must be sound and not over 2-½ inches in diameter.

### Grade 2

1. Logs must be 12 inches or larger, 10 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.
2. Logs must be at least 50 percent clear on each of three faces or 75 percent clear on two faces.

### Grade 3

1. Logs must be 6 inches or larger, 8 feet or longer, and with a net scale after deduction for defect of at least 50 percent of the gross contents of the log.

Note: (A) Diameters are diameter inside bark at small end of log.
(B) Percent clear refers to percent clear in one continuous section.

## PRINCIPAL TREE SPECIES GROUPS IN KANSAS[2]

| | |
|---|---|
| Softwoods | |
| Eastern redcedar | *Juniperus virginiana* |
| Hardwoods | |
| Bur oak | *Quercus macrocarpa* |
| Select white oak | |
| White oak | *Quercus alba* |
| Chinkapin oak | *Quercus muehlenbergii* |
| Other white oak | |
| Post oak | *Quercus stellata* |
| Select red oak | |
| Northern red oak | *Quercus rubra* |
| Shumard oak | *Quercus shumardii* |
| Other red oak | |
| Black oak | *Quercus velutina* |
| Blackjack oak | *Quercus marilandica* |
| Pin oak | *Quercus palustris* |
| Shingle oak | *Quercus imbricaria* |
| Hickory | |
| Shellbark hickory | *Carya laciniosa* |
| Mockernut hickory | *Carya tomentosa* |
| Shagbark hickory | *Carya ovata* |
| Bitternut hickory | *Carya cordiformis* |
| Black hickory | *Carya texana* |
| Pecan | *Carya illinoensis* |
| Hard maple | |
| Sugar maple | *Acer saccharum* |
| Soft maple | |
| Silver maple | *Acer saccharinum* |
| Ash | |
| Green ash | *Fraxinus pennsylvanica* |
| White ash | *Fraxinus americana* |
| Cottonwood | |
| Eastern cottonwood | *Populus deltoides* |
| Basswood | |
| American basswood | *Tilia americana* |
| Elm | |
| American elm | *Ulmus americana* |
| Siberian elm | *Ulmus pumila* |
| Slippery elm | *Ulmus rubra* |
| Black walnut | *Juglans nigra* |
| Willow | |
| Black willow | *Salix nigra* |
| Boxelder | *Acer negundo* |
| Hackberry | *Celtis occidentalis* |
| Sycamore | |
| American sycamore | *Platanus occidentalis* |
| Other hardwood | |
| Black cherry | *Prunus serotina* |
| Black locust | *Robinia pseudoacacia* |
| Honeylocust | *Gleditsia triacanthos* |
| Kentucky coffeetree | *Gymnocladus dioicus* |
| Northern catalpa | *Catalpa speciosa* |
| Common persimmon | *Diospyros virginiana* |
| Red mulberry | *Morus rubra* |
| River birch | *Betula nigra* |
| Sugarberry | *Celtis laevigata* |
| Texas buckeye | *Aesculus glabra* var. *arguta* |

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[2] *The common and scientific names are based on: Little, Elbert L., Jr. Checklist of United States Trees (Native and Naturalized). Agric. Handb. 541. Washington, DC: U.S. Department of Agriculture, Forest Service; 1979. 375 p.*

# METRIC EQUIVALENTS OF UNITS USED IN THIS REPORT

1 acre = 4,046.86 square meters or 0.405 hectare.
1,000 acres = 405 hectares.
1,000 board feet (International ¼-inch log rule) = 3.48 cubic meters.
Breast height = 1.4 meters above the ground.
1 cubic foot = 0.0283 cubic meter.
1 foot = 30.48 centimeters or 0.3048 meter.
1 inch = 25.4 millimeters, 2.54 centimeters, or 0.0254 meter.

# DEFINITION OF TERMS

**Acceptable trees.**—Growing-stock trees of commercial species that meet specified standards of size and quality but do not qualify as desirable trees.

**Area-condition classes.**—*Class 10.*—Areas fully stocked with desirable trees but not overstocked.

*Class 20.*—Areas fully stocked with desirable trees, but overstocked with all live trees.

*Class 30.*—Areas medium to fully stocked with desirable trees, and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

*Class 40.*—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

*Class 50.*—Areas poorly stocked with desirable trees, but fully stocked with growing-stock trees.

*Class 60.*—Areas poorly stocked with desirable trees, but with medium to full stocking of growing-stock trees.

*Class 70.*—Areas poorly stocked with desirable trees and poorly stocked with growing-stock trees.

**Basal area.**—The area in square feet of the cross section at breast height of a single tree. When the basal area of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

**Biomass.**—The above-ground volume of all live trees (including bark and foliage) reported in green tons. Biomass is made up of 5 components:

*Growing-stock bole.*—Biomass of a growing-stock tree from a 1-foot stump to a variable 4-inch top.

*Growing-stock tops and limbs.*—Biomass of a growing-stock tree from a 1-foot stump minus the growing-stock bole.

*Cull bole.*—Biomass of a cull tree from a 1-foot stump to a variable 4-inch top.

*Cull tops and limbs.*—Biomass of a cull tree from a 1-inch stump minus the cull bole.

*1- to 5-inch trees.*—Biomass of all live trees 1- to 5-inches in diameter at breast height.

**Commercial forest land.**—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying as commercial forest land have the capability of producing in excess of 20 cubic feet per acre per year of annual growth under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.) Also see definition of pastured commercial forest land.

**Commercial species.**—Tree species presently or prospectively suitable for industrial wood products. (Note: Excludes species of typically small size, poor form, or inferior quality such as hophornbeam and hawthorn.)

**County and municipal land.**—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

**Cull.**—Portions of a tree that are unusable for industrial wood products, because of rot, form, or other defect.

**Desirable trees.**—Growing-stock trees having no serious defects in quality limiting present or prospective use, and of relatively high vigor, and containing no pathogens that may result in death or serious deterioration before rotation age. These are trees that would be favored by forest managers in silvicultural operations.

**Diameter classes.**—A classification of trees based on diameter outside bark, measured at breast height (4-½ feet above the ground). (Note: d.b.h. is the common abbreviation for diameter at breast height. Two-inch diameter classes are commonly used in Forest Inventory and Analysis, with the even inch the approximate midpoint for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches d.b.h. inclusive).

**Farm.**—Any place from which $1,000 or more of agricultural products were sold or normally would have been sold during the year.

**Farmer-owned land.**—Land owned by operators of farms. (Note: Excludes land leased by farm operators from nonfarm owners, such as railroad companies and States.)

**Forest land.**—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use. (Note: Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing with specified standards.) The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, or other bodies of water or clearings in forest areas shall be classed as forest if less than 120 feet in width. Also see definitions of land area, commercial forest land, noncommercial forest land, productive-reserved forest land, stocking, unproductive forest land, nonforest land, and water.

**Forest industry land.**—Land owned by companies or individuals operating primary wood-using plants.

**Forest trees.**—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

**Forest types.**—A classification of forest land based upon the species forming a plurality of live tree stocking. Major forest types in Kansas are:

*Eastern redcedar-hardwood.*—Forests in which hardwoods comprise a plurality of the stocking but in which eastern redcedar comprises 25 percent or more of the stocking. Found on dry uplands, usually abandoned pastures or fields.

*Oak-hickory.*—Forests in which upland oaks (white, northern red, black) or hickory, singly or in combination, comprise a plurality of the stocking, except for stands classed as eastern redcedar-hardwood or as post-blackjack oak. Occurs on a variety of soils.

*Post-blackjack oak.*—Forests in which post oak or blackjack oak, singly or in combination, comprise a majority of the stocking. Occurs on dry uplands and ridges.

*Upland plains hardwoods.*—Forests in which black walnut, hackberry, and bur oak, singly or in combination, comprise a plurality of the stocking. Commonly found on slopes and uplands.

*Elm-ash-cottonwood.*—Lowland forest in which elm, ash, cottonwood, and willow, singly or in combination, comprise a plurality of the stocking, except for those in which cottonwood or willow comprise a majority of the stocking. Found on first or second bottoms of major streams.

*Cottonwood.*—Forests in which cottonwood comprises a majority of the stocking.

*Willow.*—Forests in which willow comprises a majority of the stocking.

*Lowland plains hardwoods.*—Forests in which black walnut, hackberry, bur oak, soft maple, and boxelder, singly or in combination, comprise a plurality of the stocking. Commonly found in coves and bottomlands.

*Upland elm-ash-locust.*—Upland forests in which elm, ash, and honeylocust, singly or in combination, comprise a plurality of the stocking. Includes shelterbelts and windbreaks on sites drier than those commonly associated with lowland species.

**Gross area.**—The entire area of land and water as determined by the Bureau of the Census, 1980.

**Growing-stock trees.**—Live trees of commercial species qualifying as desirable and acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

**Growing-stock volume.**—Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over, from a 1-foot stump to a minimum 4.0 inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs. Cubic feet can be converted to cords by dividing by 79 cubic feet per solid wood cord.

**Hardwoods.**—Dicotyledonous trees, usually broad-leaved and deciduous.

**Idle farmland.**—Includes former croplands, orchards, improved pastures, and farm sites not tended within the past 2 years and presently less than 16.7 percent stocked with trees.

**Improved pasture.**—Land currently improved for grazing by cultivating, seeding, irrigating, or clearing of trees or brush, and less than 16.7 percent stocked with live trees.

**Indian lands.**—Tribal lands held in fee but administered by the Federal Government.

**Land area.**—A. *Bureau of the Census.* The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area.

B. *Forest Inventory and Analysis.* The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Live trees.**—Growing-stock, rough, and rotten trees 1 inch d.b.h. and larger.

**Log grades.**—A classification of logs based on external characteristics as indicators of quality or value. (See Appendix for specific grading factors used.)

**Logging residues.**—The unused growing-stock portions of trees cut or killed by logging.

**Maintained road.**—Any road, hard-topped or other surfaces, that is plowed or graded at least once a year. Includes rights-of-way that are cut or treated to limit herbaceous growth.

**Marsh.**—Nonforest land that characteristically supports low, generally herbaceous or shrubby vegetation and that is intermittently covered with water.

**Merchantable.**—Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

**Miscellaneous federal lands.**—Federal land other than National Forest, primarily land administered by the Bureau of Land Management.

**Miscellaneous private lands.**—Privately owned lands other than forest industry and farmer-owned land.

**Mortality.**—The volume of sound wood in growing-stock and sawtimber trees that die annually.

**National forest land.**—Federal lands that have been legally designated as National Forests or purchase units, and other lands under the administration of the USDA Forest Service.

**Net annual growth of growing stock.**—The annual change in volume of sound wood in live sawtimber and poletimber trees and the total volume of trees entering these classes through ingrowth, less volume losses resulting from natural causes.

**Net annual growth of sawtimber.**—The annual change in the volume of live sawtimber trees and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes.

**Net volume.**—Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

**Noncommercial forest land.**—(a) Unproductive forest land and (b) productive-reserved forest land. See definition of unproductive and productive-reserved forest land.

**Noncommercial species.**—Tree species of typically small size, poor form, or inferior quality which normally do not develop into trees suitable for industrial wood products.

**Nonforest land.**—Land that has never supported forests, and lands formerly forested where use for timber management is precluded by development for other uses. (Note: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 40-acre areas of water classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide, and more than 1 acre in size, to qualify as nonforest land.)

A. *Nonforest land without trees.*—Nonforest land with no live trees present.

B. *Nonforest land with trees.*—Nonforest land with one or more trees at least 5 inches d.b.h. per acre.

**Nonstocked land.**—Commercial forest land less than 16.7 percent stocked with growing-stock trees.

**Other removals.**—Growing-stock trees removed but not utilized for products, or trees left standing but "removed" from the commercial forest land classification by land use change. Examples are removals from cultural operations such as timber stand improvement work, land clearing, and changes in land use.

**Ownership.**—Property owned by one owner, regardless of the number of parcels in a specified area.

**Ownership size class.**—The amount of commercial forest land owned by one owner, regardless of the number of parcels.

**Owner tenure.**—The length of time a property has been held by the owner.

**Pastured commercial forest land.**—Commercial forest land for which the primary use is wood production, but is presently used for grazing.

**Physiographic class.**—A measure of soil and water conditions that affect tree growth on a site. Physiographic classes used in Forest Inventory and Analysis inventories are:

*Xeric sites.*—Very dry droughty sites where excessive drainage seriously limits both growth and species occurrence. These sites are usually on upland and upper half slopes.

*Xeromesic sites.*—Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. These sites are usually on the lower half slope.

*Mesic sites.*—Deep, well-drained soils. Growth and species occurrence are limited only by climate. These include all cove sites and bottomlands along intermittent streams.

*Hydromesic sites.*—Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent. These include first and second bottoms on all major creeks and rivers.

*Hydric sites.*—Very wet sites where excess water seriously limits both growth and species occurrence.

**Plant byproducts.**—Plant residues used for products such as mulch, pulp chips, and fuelwood.

**Plant residues.**—Wood and bark materials generated at manufacturing plants during production of other products.

**Poletimber stands.**—(See stand-size class.)

**Poletimber trees.**—Growing-stock trees of commercial species at least 5.0 inches in d.b.h., but smaller than sawtimber size.

**Productive-reserved forest land.**—Forest land sufficiently productive to qualify as commercial forest land, but withdrawn from timber utilization through statute, administration regulation, designation, or exclusive use for Christmas tree production, as indicated by annual shearing.

**Rotten trees.**—Live trees of commercial species that do not contain at least one 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume in a tree is rotten.

**Rough trees.**—(a) Live trees of commercial species that do not contain at least one merchantable 12-foot saw log or two saw logs 8 feet or longer, now or prospectively, and/or do not meet Regional specifications for freedom from defect primarily because of roughness or poor form, and (b) all live trees of noncommercial species.

**Roundwood products.**—Logs, bolts, or other round sections (including chips from roundwood) cut from trees for industrial or consumer uses. (Note: Includes saw logs, veneer logs and bolts; cooperage logs and bolts; pulpwood; fuelwood; piling; poles; posts; hewn ties; mine timbers; and various other round, split, or hewn products.)

**Salvable dead trees.**—Standing or down dead trees that are considered merchantable by Regional standards.

**Saplings.**—Live trees 1.0 to 5.0 inches d.b.h.

**Sapling-seedling stands.**—(See stand-size class.)

**Saw log.**—A log meeting minimum standards of diameter, length and quality, including logs at least 8 feet long, sound and straight and with a minimum diameter outside bark (d.o.b.) for softwoods of 7 inches (9 inches for hardwoods) or other combinations of size and defect specified by Regional standards.

**Saw log portion.**—That part of the bole of sawtimber trees between the stump and the saw log top.

**Saw log top.**—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b. for hardwoods.

**Sawtimber stands.**—(See stand-size class.)

**Sawtimber trees.**—Growing-stock trees of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting Regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches d.b.h.

**Sawtimber volume.**—Net volume of the saw log portion of live sawtimber in board feet, International ¼-inch rule, from stump to a minimum 7 inches top d.o.b. for softwoods and a minimum 9 inches top d.o.b. for hardwoods.

**Seedlings.**—Live trees less than 1.0 inch in d.b.h. that are expected to survive. Only softwood seedlings more than 6 inches tall and hardwood seedlings more than 1 foot tall are counted.

**Short-log (rough tree).**—Live trees of commercial species that contain one merchantable 8- to 11-foot saw log but not a 12-foot saw log, now or prospectively.

**Shrub biomass.**—The total above-ground volume (including the bark) of selected shrubs and trees less than 1-inch d.b.h.

**Site classes.**—A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully-stocked natural stands.

**Site index.**—An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

**Softwoods.**—Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Stand.**—A growth of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

**Stand-age class.**—Age of the main stand. Main stand refers to trees of the dominant forest type and stand-size class.

**Stand-area class.**—The extent of a continuous forested area of the same forest type, stand-size class, and stand-density class.

**Stand-size class.**—A classification of forest land based on the size class of growing-stock trees on the area; that is, sawtimber, poletimber or seedlings and saplings.

*Sawtimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

*Poletimber stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

*Sapling-seedling stands.*—Stands at least 16.7 percent stocked with growing-stock trees of which more than half of the stocking is saplings and/or seedlings.

*Nonstocked stands.*—Stands in which stocking of growing-stock trees is less than 16.7 percent.

**State lands.**—Lands owned by States, or lands leased to these governmental units for 50 years or more.

**Stocking.**—The degree of occupancy of land by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

A stocking percent of 100 indicates full utilization of the site and is equivalent to 80 square feet of basal area per acre in trees 5 inches d.b.h. and larger. In a stand of trees less than 5 inches d.b.h., a stocking percent of 100 would indicate that the present number of trees is sufficient to produce 80 square feet of basal area per acre when the trees reach 5 inches d.b.h.

Stands are grouped into the following stocking classes:

*Overstocked stands.*—Stands in which stocking of trees is 134.0 percent or more.

*Fully stocked stands.*—Stands in which stocking of trees is from 101.0 to 133.9 percent.

*Medium stocked stands.*—Stands in which stocking of trees is from 61.0 to 100.9 percent.

*Poorly stocked stands.*—Stands in which stocking of trees is from 16.7 to 60.9 percent.

*Nonstocked areas.*—Commercial forest land on which stocking of trees is less than 16.7 percent.

**Timber removals from growing stock.**—The volume of sound wood in growing-stock trees removed annually for forest products (including roundwood products and logging residues) and for other removals.

**Timber removals from sawtimber.**—The net board-foot volume of live sawtimber trees removed for forest products annually (including roundwood products and logging residues) and for other removals.

**Timber products output.**—All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

**Tree biomass.**—The total above-ground volume (including the bark) of all trees 1 to 5 inches in d.b.h., and the total above-ground volume (including the bark) from a 1-foot stump for trees more than 5 inches in d.b.h.

**Tree size class.**—A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

**Unproductive forest land.**—Forest land incapable of producing 20 cubic feet per acre of annual growth or of yielding crops of industrial wood under natural conditions because of adverse site conditions. (Note: Adverse conditions include shallow soils, dry climate, poor drainage, high elevation, steepness, and rockiness.

**Upper stem portion.**—That part of the bole of sawtimber trees above the saw log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

**Urban and other areas.**—Areas within the legal boundaries of cities, and towns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards; cemeteries; roads; railroads; airports; beaches; powerlines; and other rights-of-way; or other nonforest land not included in any other specified land use class.

**Water.**—(a) *Bureau of the Census.*—Streams, sloughs, estuaries, and canals more than ⅛ of a statute mile wide; and lakes, reservoirs, and ponds more than 40 acres in area.

(b) *Noncensus.*—The same as the Bureau of the Census, except minimum width of streams, etc. is 120 feet and minimum size of lakes, etc. is 1 acre.

**Windbreak.**—A group of trees less than 120 feet wide used for the protection of soil, cropfields, and buildings in use.

**Wooded pasture.**—Improved pasture with more than 16.7 percent stocking in live trees but less than 25 percent stocking in growing-stock trees. Area is currently improved for grazing or there is other evidence of grazing. (Nonforest land with trees).

**Wooded strips.**—An acre or more of natural continuous forest land that would otherwise meet survey standards for commercial forest land except that it is less than 120 feet wide. (Nonforest land with trees.)

# TABLES

## AREA

Table 1.—Area of land by land class, 1965 and 1981

Table 2.—Area of land by land class and Forest Survey Unit

Table 3.—Area of land and forest land by county

Table 4.—Area of commercial forest land by ownership class and Forest Survey Unit

Table 5.—Area of commercial forest land by ownership class and forest type

Table 6.—Area of commercial forest land by ownership class and site class

Table 7.—Area of commercial forest land by ownership class and ownership size class

Table 8.—Area of commercial forest land by ownership class, stand-size class, and Forest Survey Unit

Table 9.—Area of commercial forest land by ownership class and area-condition class

Table 10.—Area of commercial forest land by ownership class and stand-volume class

Table 11.—Area of commercial forest land by county and forest type

Table 12.—Area of commercial forest land by forest type and stand-age class

Table 13.—Area of commercial forest land by forest type, stand-size class, and Forest Survey Unit

Table 14.—Area of commercial forest land by forest type, stand-size class, and site class

Table 15.—Area of commercial forest land by forest type, stand-size class, and stocking percent

Table 16.—Area of commercial forest land by forest type, site-index class, and Forest Survey Unit

Table 17.—Area of commercial forest land by forest type and basal-area class

Table 18.—Area of commercial forest land by forest type and distance to road

Table 19.—Area of commercial forest land by forest type and distance to water

Table 20.—Area of commercial forest land by forest type and stand-area class

Table 21.—Area of commercial forest land by stocking class based on selected stand components

Table 22.—Area of commercial forest land by forest type, physiographic class, and ownership class

Table 23.—Area of noncommercial forest land by ownership class

Table 24.—Area of noncommercial forest land by forest type and Forest Survey Unit

Table 25.—Area of nonforest land with trees by land use, forest type and Forest Survey Unit

Table 26.—Area of nonforest land with trees by forest type and stand-size class

Table 27.—Area of windbreaks by forest type, stand-size class, and Forest Survey Unit

Table 28.—Area of wooded strips by forest type, stand-size class, and ownership class

Table 29.—Area of wooded strips by forest type and site-index class

Table 30.—Area of wooded strips by forest type, basal-area class, and Forest Survey Unit

Table 31.—Area of wooded strips by forest type and stand-age class

Table 32.—Area of wooded strips by forest type, physiographic class, and ownership class

Table 33.—Area of wooded strips in private ownership by ownership class, owner tenure, and ownership size class

## NUMBER OF TREES

Table 34.—Number of all live trees on commercial forest land by species group and diameter class

Table 35.—Number of growing-stock trees on commercial forest land by species group and diameter class

Table 36.—Number of short-log trees on commercial forest land by species group and diameter class

## VOLUME

Table 37.—Net volume of growing stock and sawtimber on commercial forest land by species group, 1965 and 1981

Table 38.—Net volume of all live trees on commercial forest land by species group and diameter class

Table 39.—Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods

Table 40.—Net volume of growing-stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species

Table 41.—Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species

Table 42.—Net volume of growing stock on commercial forest land by species group and Forest Survey Unit

Table 43.—Net volume of sawtimber on commercial forest land by species group and Forest Survey Unit

Table 44.—Net volume of growing stock on commercial forest land by county and species group

Table 45.—Net volume of sawtimber on commercial forest land by county and species group

Table 46.—Net volume of growing stock on commercial forest land by species group and diameter class

Table 47.—Net volume of sawtimber on commercial forest land by species group and diameter class

Table 48.—Net volume of growing stock on commercial forest land by species group and forest type

Table 49.—Net volume of sawtimber on commercial forest land by species group and forest type

Table 50.—Net volume of growing stock on commercial forest land by species group and ownership class

Table 51.—Net volume of sawtimber on commercial forest land by species group and ownership class

Table 52.—Net volume of growing stock on commercial forest land by forest type and stand-age class

Table 53.—Net volume of sawtimber on commercial forest land by forest type and stand-age class

Table 54.—Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 55.—Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 56.—Net volume of sawtimber on commercial forest land by species group and butt log-grade class

Table 57.—Net volume of growing-stock trees by forest type and ground land use

Table 58.—Net volume of black walnut by land class and tree class

Table 59.—Net volume of growing-stock and short-log trees on commercial forest land and wooded strips by species group and Forest Survey Unit

Table 60.—Net volume of sawtimber and short-log trees on commercial forest land and wooded strips by species group and Forest Survey Unit

Table 61.—Net volume of short-log trees on commercial forest land by species group and diameter class (In thousand cubic feet)

Table 62.—Net volume of short-log trees on commercial forest land by species group and diameter class (In thousand board feet)

Table 63.—Net volume of all live trees on wooded strips by species group and diameter class

Table 64.—Net volume of sawtimber on wooded strips by species group and diameter class

Table 65.—Net volume of short-log trees on wooded strips by species group and diameter class

Table 66.—Net volume of growing stock on wooded strips by species group and forest type

Table 67.—Net volume of sawtimber on wooded strips by species group and forest type

# GROWTH AND REMOVALS

Table 68.—Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, 1964 and 1980

Table 69.—Net annual growth of growing stock on commercial forest land by species group and Forest Survey Unit

Table 70.—Net annual growth of sawtimber on commercial forest land by species group and Forest Survey Unit

Table 71.—Net annual growth of growing stock on commercial forest land by species group and ownership class

Table 72.—Net annual growth of sawtimber on commercial forest land by species group and ownership class

Table 73.—Net annual growth of growing stock on commercial forest land by species group and forest type

Table 74.—Net annual growth of sawtimber on commercial forest land by species group and forest type

Table 75.—Net annual growth of growing stock on commercial forest land by forest type and stand-age class

Table 76.—Net annual growth of sawtimber on commercial forest land by forest type and stand-age class

Table 77.—Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class

Table 78.—Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class

Table 79.—Net annual growth of growing stock on wooded strips by species group and Forest Survey Unit

Table 80.—Net annual growth of sawtimber o wooded strips by species group and For est Survey Unit

Table 81.—Timber removals from growing stock o commercial forest land by species grou and Forest Survey Unit

Table 82.—Timber removals from sawtimber o commercial forest land by species grou and Forest Survey Unit

Table 83.—Timber removals from growing stock an sawtimber on commercial forest land b species group, 1964 and 1980

Table 84.—Timber removals from growing stock an sawtimber on commercial forest land b item and species category

Table 85.—Net annual growth and removals o growing stock on commercial forest lan by species group

Table 86.—Net annual growth and removals o sawtimber on commercial forest land b species group

Table 87.—Net annual growth and removals o growing stock on commercial forest lan by ownership class and softwoods an hardwoods

Table 88.—Net annual growth and removals o sawtimber on commercial forest land by ownership class and softwoods an hardwoods

# MORTALITY

Table 89.—Annual mortality of growing stock o commercial forest land by softwoods an hardwoods, 1964 and 1980

Table 90.—Annual mortality of growing stock o commercial forest land by species grou and cause

Table 91.—Annual mortality of sawtimber on com mercial forest land by species group an cause

Table 92.—Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods

## UTILIZATION

Table 93.—Output of timber products by product, softwoods and hardwoods, and source of material

Table 94.—Output of roundwood products by product, softwoods and hardwoods, and source of material

Table 95.—Timber products from roundwood by species group and product

Table 96.—Volume of primary plant residue by type of use and kind of material

## BIOMASS

Table 97.—All live shrub biomass yields on commercial forest land by species group and forest type

Table 98.—All live tree biomass yields on commercial forest land by species group and forest type

Table 99.—All live tree biomass on commercial forest land by species group and forest type

Table 100.—All live tree biomass weight by species group and tree biomass component

Table 101.—All live tree biomass volume by species group and tree biomass component

## SAMPLING ERRORS

Table 102.—Sampling errors for estimates smaller than the State totals of volume, net growth, removals and area of commercial forest land

Table 1.--Area of land by land class, Kansas, 1965 and 1981

(In thousand acres)

| Land class | 1965[1] | 1981 |
|---|---|---|
| Forest land | | |
| Commercial forest land | | |
| Eastern redcedar-hardwood | 2.7 | 27.5 |
| Oak-hickory | 185.3 | 316.6 |
| Post-blackjack oak | 27.3 | 30.9 |
| Upland plains hardwoods | 113.1 | 49.4 |
| Elm-ash-cottonwood | 192.9 | 289.6 |
| Cottonwood | 65.0 | 68.1 |
| Willow | 8.7 | 4.2 |
| Lowland plains hardwoods | 220.7 | 265.9 |
| Upland elm-ash-locust | 228.6 | 110.3 |
| Nonstocked | 147.2 | 45.4 |
| Subtotal | 1,191.5 | 1,207.9 |
| Noncommercial forest land | | |
| Unproductive | 157.4 | 128.4 |
| Productive-reserved | 0.9 | 22.4 |
| Subtotal | 158.3 | 150.8 |
| Total | 1,349.8 | 1,358.7 |
| Nonforest land | 51,160.9 | 50,979.3 |
| All land | 52,510.7 | 52,338.0 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1981 areas because of changes in survey definitions and procedures.

Table 2.--Area of land by land class and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Land class | All units | Forest Survey Unit: Northeastern unit | Forest Survey Unit: Southeastern unit | Forest Survey Unit: Western unit |
|---|---|---|---|---|
| FOREST LAND | | | | |
| Commercial forest land | | | | |
| Unpastured commercial forest | 825.1 | 401.4 | 284.5 | 139.2 |
| Pastured commercial forest[1] | 382.8 | 186.7 | 152.5 | 43.6 |
| Subtotal | 1,207.9 | 588.1 | 437.0 | 182.8 |
| Noncommercial forest land | | | | |
| Unproductive | 128.4 | 21.0 | 97.0 | 10.4 |
| Productive-reserved | 22.4 | 15.1 | 2.3 | 5.0 |
| Subtotal | 150.8 | 36.1 | 99.3 | 15.4 |
| Total | 1,358.7 | 624.2 | 536.3 | 198.2 |
| NONFOREST LAND | | | | |
| Nonforest with trees | | | | |
| Cropland | 63.0 | 30.2 | 13.6 | 19.2 |
| Improved pasture[2] | 533.6 | 139.4 | 225.2 | 169.0 |
| Wooded strips[3] | 150.0 | 62.6 | 50.3 | 37.1 |
| Idle farmland | 23.9 | 4.1 | 2.5 | 17.3 |
| Marsh | 22.7 | 4.2 | 4.3 | 14.2 |
| Windbreaks[4] | 186.3 | 43.0 | 66.9 | 76.4 |
| Wooded pasture[2] | 209.8 | 60.5 | 95.2 | 54.1 |
| Subtotal | 1,189.3 | 344.0 | 458.0 | 387.3 |
| Nonforest without trees | | | | |
| Cropland | 32,163.2 | 5,026.1 | 3,850.3 | 23,286.8 |
| Improved pasture[2] | 15,827.4 | 1,922.7 | 4,549.0 | 9,355.7 |
| Idle farmland | 7.5 | 2.9 | 4.6 | 0 |
| Marsh | 56.3 | 1.5 | 6.9 | 47.9 |
| Other farm-farmstead | 198.9 | 67.0 | 35.4 | 96.5 |
| Urban and other | 1,417.9 | 374.3 | 338.5 | 705.1 |
| Noncensus water | 118.8 | 32.2 | 34.3 | 52.3 |
| Subtotal | 49,790.0 | 7,426.7 | 8,819.0 | 33,544.3 |
| Total | 50,979.3 | 7,770.7 | 9,277.0 | 33,931.6 |
| TOTAL LAND[5] | 52,338.0 | 8,394.9 | 9,813.3 | 34,129.8 |
| WATER (BUREAU OF THE CENSUS)[5] | 319.5 | 155.9 | 77.5 | 86.1 |
| TOTAL LAND AND WATER[5] | 52,657.5 | 8,550.8 | 9,890.8 | 34,215.9 |

[1] Forest land for which the primary use is wood production, but is used for grazing.

[2] Includes areas classified as range by the USDA Soil Conservation Service.

[3] An acre or more of natural continuous forest land less than 120 feet wide that would otherwise meet survey standards.

[4] A group of trees less than 120 feet wide used for the protection of soil, cropfields, and buildings in use.

[5] U.S. Department of Commerce, Bureau of the Census. 1980. State/county area measurement reports (unpublished).

Table 3.--Area of land and forest land by county, Kansas, 1981

| County | Land area[1/] | Forest land: All forest | Forest land: Non-commercial | Forest land: Commercial | Forest land: Percent commercial forest | Nonforest land with trees: All nonforest with trees | Nonforest land with trees: Wooded strips | Nonforest land with trees: Other nonforest with trees | Nonforest land with trees: Percent nonforest with trees |
|---|---|---|---|---|---|---|---|---|---|
| | Thousand acres | Thousand acres | Thousand acres | Thousand acres | Percent | Thousand acres | Thousand acres | Thousand acres | Percent |
| NORTHEASTERN UNIT | | | | | | | | | |
| Atchison | 275.7 | 24.8 | 1.0 | 23.8 | 8.6 | 8.3 | 1.8 | 6.5 | 3.0 |
| Brown | 365.8 | 19.7 | 1.0 | 18.7 | 5.1 | 9.5 | 1.3 | 8.2 | 2.6 |
| Clay | 404.2 | 16.0 | 0.7 | 15.3 | 3.8 | 5.0 | 0.9 | 4.1 | 1.2 |
| Dickinson | 545.4 | 14.0 | 0.5 | 13.5 | 2.5 | 7.0 | 1.2 | 5.8 | 1.3 |
| Doniphan | 248.0 | 29.9 | 1.2 | 28.7 | 11.6 | 12.9 | 1.9 | 11.0 | 5.2 |
| Douglas | 294.9 | 30.0 | 1.9 | 28.1 | 9.5 | 20.5 | 2.5 | 18.0 | 7.0 |
| Franklin | 369.4 | 27.3 | 1.6 | 25.7 | 7.0 | 14.6 | 2.5 | 12.1 | 4.0 |
| Geary | 241.2 | 21.1 | 2.5 | 18.6 | 7.7 | 9.5 | 1.5 | 8.0 | 3.9 |
| Jackson | 420.9 | 33.5 | 1.1 | 32.4 | 7.7 | 24.2 | 6.4 | 17.8 | 5.7 |
| Jefferson | 342.6 | 43.5 | 2.5 | 41.0 | 12.0 | 22.6 | 3.0 | 19.6 | 6.6 |
| Johnson | 305.9 | 27.4 | 1.4 | 26.0 | 8.5 | 13.7 | 2.1 | 11.6 | 4.5 |
| Leavenworth | 296.0 | 45.8 | 2.5 | 43.3 | 14.6 | 23.2 | 5.9 | 17.3 | 7.8 |
| Marshall | 561.7 | 31.5 | 1.8 | 29.7 | 5.3 | 30.4 | 4.0 | 26.4 | 5.4 |
| Miami | 377.5 | 47.9 | 1.6 | 46.3 | 12.3 | 23.0 | 5.2 | 17.8 | 6.1 |
| Nemaha | 459.9 | 16.9 | 0.6 | 16.3 | 3.5 | 7.3 | 1.8 | 5.5 | 1.6 |
| Osage | 444.7 | 34.4 | 3.2 | 31.2 | 7.0 | 21.1 | 3.4 | 17.7 | 4.7 |
| Pottawatomie | 529.8 | 44.4 | 3.5 | 40.9 | 7.7 | 20.4 | 3.7 | 16.7 | 3.9 |
| Riley | 379.6 | 35.0 | 2.8 | 32.2 | 8.5 | 20.1 | 2.2 | 17.9 | 5.3 |
| Shawnee | 351.2 | 26.9 | 1.3 | 25.6 | 7.3 | 14.8 | 2.2 | 12.6 | 4.2 |
| Wabaunsee | 510.1 | 31.8 | 2.5 | 29.3 | 5.7 | 15.7 | 3.2 | 12.5 | 3.1 |
| Washington | 575.0 | 14.8 | 0.5 | 14.3 | 2.5 | 18.4 | 5.4 | 13.0 | 3.2 |
| Wyandotte | 95.4 | 7.6 | 0.4 | 7.2 | 7.5 | 1.8 | 0.5 | 1.3 | 1.9 |
| All counties | 8,394.9 | 624.2 | 36.1 | 588.1 | 7.0 | 344.0 | 62.6 | 281.4 | 4.1 |
| SOUTHEASTERN UNIT | | | | | | | | | |
| Allen | 323.3 | 11.4 | 1.4 | 10.0 | 3.1 | 17.3 | 2.2 | 15.1 | 5.4 |
| Anderson | 373.5 | 19.5 | 3.9 | 15.6 | 4.2 | 18.9 | 2.1 | 16.8 | 5.1 |
| Bourbon | 408.4 | 43.4 | 8.3 | 35.1 | 8.6 | 48.1 | 2.0 | 46.1 | 11.8 |
| Butler | 923.7 | 24.1 | 2.9 | 21.2 | 2.3 | 36.4 | 6.5 | 29.9 | 3.9 |
| Chase | 497.2 | 10.5 | 0.6 | 9.9 | 2.0 | 14.4 | 2.1 | 12.3 | 2.9 |
| Chautauqua | 412.0 | 67.8 | 19.3 | 48.5 | 11.8 | 29.3 | 3.0 | 26.3 | 7.1 |
| Cherokee | 377.9 | 27.0 | 5.0 | 22.0 | 5.8 | 27.1 | 2.8 | 24.3 | 7.2 |
| Coffey | 393.6 | 12.5 | 2.5 | 10.0 | 2.5 | 13.8 | 0.9 | 12.9 | 3.5 |
| Cowley | 721.7 | 28.1 | 2.8 | 25.3 | 3.5 | 14.4 | 2.9 | 11.5 | 2.0 |
| Crawford | 380.7 | 24.2 | 2.4 | 21.8 | 5.7 | 27.2 | 3.3 | 23.9 | 7.1 |
| Elk | 416.0 | 37.4 | 9.7 | 27.7 | 6.7 | 16.7 | 1.5 | 15.2 | 4.0 |
| Greenwood | 726.2 | 29.0 | 3.8 | 25.2 | 3.5 | 34.5 | 5.1 | 29.4 | 4.8 |
| Labette | 417.8 | 20.2 | 4.2 | 16.0 | 3.8 | 18.2 | 1.0 | 17.2 | 4.4 |
| Linn | 384.5 | 56.6 | 7.9 | 48.7 | 12.7 | 24.9 | 3.2 | 21.7 | 6.5 |
| Lyon | 540.5 | 12.4 | 1.2 | 11.2 | 2.1 | 11.5 | 2.4 | 9.1 | 2.1 |
| Marion | 604.2 | 9.3 | 1.9 | 7.4 | 1.2 | 6.6 | 0.8 | 5.8 | 1.1 |
| Montgomery | 413.3 | 29.4 | 6.5 | 22.9 | 5.5 | 19.7 | 2.2 | 17.5 | 4.8 |
| Morris | 443.3 | 7.8 | 0.9 | 6.9 | 1.6 | 6.8 | 1.4 | 5.4 | 1.5 |
| Neosho | 368.7 | 17.1 | 3.3 | 13.8 | 3.7 | 16.2 | 1.1 | 15.1 | 4.4 |
| Wilson | 368.0 | 32.8 | 7.6 | 25.2 | 6.8 | 40.8 | 2.3 | 38.5 | 11.1 |
| Woodson | 313.8 | 15.8 | 3.2 | 12.6 | 4.0 | 15.2 | 1.5 | 13.7 | 4.8 |
| All counties | 9,813.3 | 536.3 | 99.3 | 437.0 | 4.5 | 458.0 | 50.3 | 407.7 | 4.7 |

(Table 3 continued on next page)

| County | Land area 1/ | Forest land |  |  |  | Nonforest land with trees |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  | All forest | Non-commercial | Commercial | Percent commercial forest | All nonforest with trees | Wooded strips | Other nonforest with trees | Percent nonforest with trees |
|  | Thousand acres |  |  |  | Percent | Thousand acres |  |  | Percent |
| Barber | 727.2 | 6.9 | 0.3 | 6.6 | 0.9 | 17.5 | 2.2 | 15.3 | 2.4 |
| Barton | 573.1 | 1.1 | -- | 1.1 | 0.2 | 0.5 | 0.1 | 0.4 | 0.1 |
| Cheyenne | 653.4 | 2.7 | -- | 2.7 | 0.4 | 6.2 | 1.7 | 4.5 | 0.9 |
| Clark | 624.0 | 5.1 | 0.4 | 4.7 | 0.8 | 8.3 | 0.6 | 7.7 | 1.3 |
| Cloud | 459.3 | 8.7 | 0.1 | 8.6 | 1.9 | 5.5 | 0.1 | 5.4 | 1.2 |
| Comanche | 504.8 | 1.2 | 0.2 | 1.0 | 0.2 | 5.8 | 0.4 | 5.4 | 1.1 |
| Decatur | 572.0 | 2.3 | -- | 2.3 | 0.4 | 2.1 | 0.8 | 1.3 | 0.4 |
| Edwards | 396.5 | 1.7 | -- | 1.7 | 0.4 | 1.3 | 0.2 | 1.1 | 0.3 |
| Ellis | 576.3 | 2.7 | -- | 2.7 | 0.5 | 4.0 | 0.3 | 3.7 | 0.7 |
| Ellsworth | 458.9 | 3.1 | -- | 3.1 | 0.7 | 3.0 | 0.6 | 2.4 | 0.7 |
| Finney | 833.3 | 0.4 | -- | 0.4 | -- | 0.4 | 0.1 | 0.3 | -- |
| Ford | 703.2 | 0.9 | 0.2 | 0.7 | 0.1 | 5.7 | 0.4 | 5.3 | 0.8 |
| Gove | 686.0 | 0.1 | -- | 0.1 | -- | 1.8 | -- | 1.8 | 0.3 |
| Graham | 575.0 | 4.9 | 0.2 | 4.7 | 0.8 | 7.4 | 1.0 | 6.4 | 1.3 |
| Grant | 368.1 | 0.3 | 0.2 | 0.1 | -- | 2.9 | 0.1 | 2.8 | 0.8 |
| Gray | 555.2 | 2.3 | -- | 2.3 | 0.4 | 0.5 | 0.1 | 0.4 | 0.1 |
| Greeley | 498.2 | 0.1 | -- | 0.1 | -- | 0.3 | -- | 0.3 | 0.1 |
| Hamilton | 638.4 | 3.5 | 0.2 | 3.3 | 0.5 | 3.0 | 0.4 | 2.6 | 0.5 |
| Harper | 513.3 | 5.1 | 0.4 | 4.7 | 0.9 | 17.7 | 1.4 | 16.3 | 3.4 |
| Harvey | 345.9 | 1.9 | 0.2 | 1.7 | 0.5 | 6.8 | 0.7 | 6.1 | 2.0 |
| Haskell | 369.7 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hodgeman | 550.7 | -- | -- | -- | -- | 0.1 | -- | 0.1 | -- |
| Jewell | 582.2 | 11.1 | 1.3 | 9.8 | 1.7 | 12.1 | 1.5 | 10.6 | 2.1 |
| Kearny | 555.3 | 0.7 | 0.2 | 0.5 | 0.1 | 0.3 | -- | 0.3 | 0.1 |
| Kingman | 553.9 | 8.0 | 1.0 | 7.0 | 1.3 | 21.6 | 1.6 | 20.0 | 3.9 |
| Kiowa | 462.6 | 0.7 | 0.1 | 0.6 | 0.1 | 2.5 | 1.2 | 1.3 | 0.5 |
| Lane | 459.1 | 0.1 | -- | 0.1 | -- | -- | -- | -- | -- |
| Lincoln | 460.6 | 3.3 | 0.2 | 3.1 | 0.7 | 8.1 | 0.9 | 7.2 | 1.8 |
| Logan | 686.9 | 1.0 | -- | 1.0 | 0.1 | 0.4 | 0.1 | 0.3 | 0.1 |
| McPherson | 576.1 | 4.0 | 0.2 | 3.8 | 0.7 | 6.0 | 0.7 | 5.3 | 1.0 |
| Meade | 626.3 | 2.1 | 0.2 | 1.9 | 0.3 | 1.6 | 0.1 | 1.5 | 0.3 |
| Mitchell | 459.1 | 8.4 | 1.4 | 7.0 | 1.5 | 24.8 | 1.5 | 23.3 | 5.4 |
| Morton | 467.9 | 2.6 | 0.2 | 2.4 | 0.5 | 1.6 | 0.4 | 1.2 | 0.3 |
| Ness | 587.7 | 0.4 | -- | 0.4 | 0.1 | 0.1 | -- | 0.1 | -- |
| Norton | 558.6 | 3.3 | 0.3 | 3.0 | 0.5 | 5.7 | 0.7 | 5.0 | 1.0 |
| Osborne | 564.4 | 6.5 | 0.2 | 6.3 | 1.1 | 6.1 | 0.7 | 5.4 | 1.1 |
| Ottawa | 461.3 | 7.3 | 0.6 | 6.7 | 1.5 | 9.0 | 0.3 | 8.7 | 2.0 |
| Pawnee | 483.1 | 2.3 | 0.4 | 1.9 | 0.4 | 8.5 | 1.6 | 6.9 | 1.8 |
| Phillips | 567.5 | 7.4 | 1.4 | 6.0 | 1.1 | 22.4 | 1.7 | 20.7 | 3.9 |
| Pratt | 470.5 | 1.6 | -- | 1.6 | 0.3 | 0.6 | 0.1 | 0.5 | 0.1 |
| Rawlins | 684.4 | 2.2 | 0.2 | 2.0 | 0.3 | 1.8 | 0.4 | 1.4 | 0.3 |
| Reno | 805.6 | 7.3 | 1.0 | 6.3 | 0.8 | 23.9 | 0.9 | 23.0 | 3.0 |
| Republic | 459.9 | 8.7 | 0.5 | 8.2 | 1.8 | 10.8 | 0.9 | 9.9 | 2.3 |
| Rice | 465.9 | 1.8 | 0.2 | 1.6 | 0.3 | 3.4 | 0.2 | 3.2 | 0.7 |
| Rooks | 568.7 | 6.9 | 0.5 | 6.4 | 1.1 | 16.3 | 1.4 | 14.9 | 2.9 |
| Rush | 459.5 | 0.1 | -- | 0.1 | -- | 0.2 | 0.1 | 0.1 | -- |
| Russell | 556.4 | 4.6 | 0.1 | 4.5 | 0.8 | 1.5 | 0.2 | 1.3 | 0.3 |

(Table 3 continued on next page)

(Table 3 continued)

WESTERN UNIT

| County | Land area[1/] | Forest land |  |  |  | Nonforest land with trees |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  | All forest | Non-commercial | Commercial | Percent commercial forest | All nonforest with trees | Wooded strips | Other nonforest with trees | Percent nonforest with trees |
|  | Thousand acres |  |  |  | Percent | Thousand acres |  |  | Percent |
| Saline | 461.6 | 3.4 | 0.3 | 3.1 | 0.7 | 9.0 | 0.4 | 8.6 | 1.9 |
| Scott | 459.2 | 0.1 | -- | 0.1 | -- | -- | -- | -- | -- |
| Sedgwick | 644.7 | 8.0 | 1.2 | 6.8 | 1.1 | 19.1 | 0.7 | 18.4 | 3.0 |
| Seward | 409.7 | 2.1 | 0.1 | 2.0 | 0.5 | 3.1 | 0.6 | 2.5 | 0.8 |
| Sheridan | 573.5 | 1.2 | -- | 1.2 | 0.2 | 0.6 | 0.1 | 0.5 | 0.1 |
| Sherman | 676.4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Smith | 574.0 | 3.6 | -- | 3.6 | 0.6 | 5.7 | 3.9 | 1.8 | 1.0 |
| Stafford | 504.0 | 3.7 | 0.2 | 3.5 | 0.7 | 10.1 | 0.4 | 9.7 | 2.0 |
| Stanton | 435.6 | -- | -- | -- | -- | 0.9 | -- | 0.9 | 0.2 |
| Stevens | 465.6 | 0.6 | -- | 0.6 | 0.1 | 0.4 | 0.1 | 0.3 | 0.1 |
| Sumner | 757.4 | 15.7 | 0.5 | 15.2 | 2.0 | 39.6 | 2.1 | 37.5 | 5.2 |
| Thomas | 687.7 | 0.3 | -- | 0.3 | -- | 0.2 | -- | 0.2 | -- |
| Trego | 569.8 | 1.8 | 0.3 | 1.5 | 0.3 | 5.9 | 0.3 | 5.6 | 1.0 |
| Wallace | 584.7 | 0.3 | 0.2 | 0.1 | -- | 2.6 | 0.1 | 2.5 | 0.4 |
| Wichita | 459.9 | -- | -- | -- | -- | -- | -- | -- | -- |
| All counties | 34,129.8 | 198.2 | 15.4 | 182.8 | 0.5 | 387.3 | 37.1 | 350.2 | 1.1 |
| All units | 52,338.0 | 1,358.7 | 150.8 | 1,207.9 | 2.3 | 1,189.3 | 150.0 | 1,039.3 | 2.3 |

### Table 4.--Area of commercial forest land by ownership class and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Ownership class | All Units | North-eastern Unit | South-eastern Unit | Western Unit |
|---|---|---|---|---|
| National Forest | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | 26.2 | 8.3 | 2.1 |
| Indian | 4.0 | 4.0 | -- | -- |
| State | 7.5 | -- | 5.0 | 2.5 |
| County and municipal | 2.3 | 1.2 | 1.1 | -- |
| Farmer | 749.5 | 338.7 | 284.1 | 126.7 |
| Miscellaneous private | 408.0 | 218.0 | 138.5 | 51.5 |
| All owners | 1,207.9 | 588.1 | 437.0 | 182.8 |

Table 5.--Area of commercial forest land by ownership class and forest type, Kansas, 1981

Table 5.--Area of commercial forest land by ownership class and forest type, Kansas, 1981

(In thousand acres)

| Ownership class | All types | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| National Forest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | 1.6 | 6.8 | 1.2 | 2.5 | 8.6 | 3.0 | -- | 7.1 | 5.8 | -- |
| Indian | 4.0 | -- | 1.2 | -- | -- | 1.6 | -- | -- | -- | 1.2 | -- |
| State | 7.5 | -- | 2.5 | -- | -- | 1.1 | 2.5 | -- | -- | -- | 1.4 |
| County and municipal | 2.3 | -- | -- | -- | 1.1 | 1.2 | -- | -- | -- | -- | -- |
| Farmer | 749.5 | 18.7 | 184.4 | 22.6 | 26.8 | 182.2 | 35.2 | 1.0 | 186.6 | 63.3 | 28.7 |
| Miscellaneous private | 408.0 | 7.2 | 121.7 | 7.1 | 19.0 | 94.9 | 27.4 | 3.2 | 72.2 | 40.0 | 15.3 |
| All owners | 1,207.9 | 27.5 | 316.6 | 30.9 | 49.4 | 289.6 | 68.1 | 4.2 | 265.9 | 110.3 | 45.4 |

Table 6.--Area of commercial forest land by ownership class and site class, Kansas, 1981

(In thousand acres)

| Ownership class | All classes | Site class (cubic feet of growth/acre/year) | | | |
|---|---|---|---|---|---|
| | | 119+ | 85-119 | 50-84 | 20-49 |
| National Forest | -- | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | -- | 3.7 | 16.8 | 16.1 |
| Indian | 4.0 | -- | -- | -- | 4.0 |
| State | 7.5 | -- | 2.2 | 1.3 | 4.0 |
| County and municipal | 2.3 | -- | 2.3 | -- | -- |
| Farmer | 749.5 | 3.4 | 89.0 | 297.7 | 359.4 |
| Miscellaneous private | 408.0 | 1.2 | 60.7 | 171.6 | 174.5 |
| All owners | 1,207.9 | 4.6 | 157.9 | 487.4 | 558.0 |

Table 7.--Area of commercial forest land by ownership class and ownership size class, Kansas, 1981

(In thousand acres)

| Ownership class | All classes | Ownership size class (acres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-5 | 5-10 | 10-20 | 20-50 | 50-100 | 100-500 | 500-2,500 | 2,500-5,000 | 5,000+ |
| National Forest | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | -- | -- | -- | -- | -- | -- | -- | -- | 36.6 |
| Indian | 4.0 | -- | -- | -- | -- | -- | -- | -- | -- | 4.0 |
| State | 7.5 | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 |
| County and municipal | 2.3 | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- |
| Farmer | 749.5 | 12.6 | 89.8 | 171.1 | 299.4 | 118.0 | 56.5 | 2.1 | -- | -- |
| Miscellaneous private | 408.0 | 18.4 | 43.0 | 101.2 | 101.9 | 76.6 | 38.5 | 19.8 | -- | 8.6 |
| All owners | 1,207.9 | 31.0 | 132.8 | 272.3 | 401.3 | 194.6 | 95.0 | 24.2 | -- | 56.7 |

Table 8.--Area of commercial forest land by ownership class, stand-size class, and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Ownership class | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| ALL UNITS | | | | | |
| National Forest | -- | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | 18.1 | 4.4 | 14.1 | -- |
| Indian | 4.0 | 1.2 | -- | 2.8 | -- |
| State | 7.5 | 3.6 | 2.5 | -- | 1.4 |
| County and municipal | 2.3 | 2.3 | -- | -- | -- |
| Farmer | 749.5 | 357.0 | 139.7 | 224.1 | 28.7 |
| Miscellaneous private | 408.0 | 182.8 | 87.8 | 122.1 | 15.3 |
| All owners | 1,207.9 | 565.0 | 234.4 | 363.1 | 45.4 |
| NORTHEASTERN UNIT | | | | | |
| National Forest | -- | -- | -- | -- | -- |
| Miscellaneous federal | 26.2 | 13.4 | 1.1 | 11.7 | -- |
| Indian | 4.0 | 1.2 | -- | 2.8 | -- |
| State | -- | -- | -- | -- | -- |
| County and municipal | 1.2 | 1.2 | -- | -- | -- |
| Farmer | 338.7 | 146.3 | 62.0 | 116.3 | 14.1 |
| Miscellaneous private | 218.0 | 80.9 | 49.2 | 82.7 | 5.2 |
| All owners | 588.1 | 243.0 | 112.3 | 213.5 | 19.3 |
| SOUTHEASTERN UNIT | | | | | |
| National Forest | -- | -- | -- | -- | -- |
| Miscellaneous federal | 8.3 | 4.7 | 1.2 | 2.4 | -- |
| Indian | -- | -- | -- | -- | -- |
| State | 5.0 | 3.6 | -- | -- | 1.4 |
| County and municipal | 1.1 | 1.1 | -- | -- | -- |
| Farmer | 284.1 | 127.0 | 58.9 | 94.1 | 4.1 |
| Miscellaneous private | 138.5 | 56.0 | 36.5 | 35.9 | 10.1 |
| All owners | 437.0 | 192.4 | 96.6 | 132.4 | 15.6 |
| WESTERN UNIT | | | | | |
| National Forest | -- | -- | -- | -- | -- |
| Miscellaneous federal | 2.1 | -- | 2.1 | -- | -- |
| Indian | -- | -- | -- | -- | -- |
| State | 2.5 | -- | 2.5 | -- | -- |
| County and municipal | -- | -- | -- | -- | -- |
| Farmer | 126.7 | 83.7 | 18.8 | 13.7 | 10.5 |
| Miscellaneous private | 51.5 | 45.9 | 2.1 | 3.5 | -- |
| All owners | 182.8 | 129.6 | 25.5 | 17.2 | 10.5 |

Table 9.--Area of commercial forest land by ownership class and area-condition class, Kansas, 1981

(In thousand acres)

| Ownership class | All classes | Area-condition class | | | |
|---|---|---|---|---|---|
| | | 70 | 60 | 50 | 40 or better |
| National Forest | -- | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | 8.9 | 23.3 | 4.4 | -- |
| Indian | 4.0 | 4.0 | -- | -- | -- |
| State | 7.5 | 1.5 | 5.0 | 1.0 | -- |
| County and municipal | 2.3 | -- | 2.3 | -- | -- |
| Farmer | 749.5 | 360.9 | 335.0 | 53.6 | -- |
| Miscellaneous private | 408.0 | 179.2 | 183.8 | 45.0 | -- |
| All owners | 1,207.9 | 554.5 | 549.4 | 104.0 | -- |

Table 10.--Area of commercial forest land by ownership class and stand-volume class, Kansas, 1981

(In thousand acres)

| Ownership class | All classes | Stand-volume class (board feet[1] per acre) | | |
|---|---|---|---|---|
| | | Less than 1,500 | 1,500 to 5,000 | 5,000+ |
| National Forest | -- | -- | -- | -- |
| Miscellaneous federal | 36.6 | 15.8 | 12.4 | 8.4 |
| Indian | 4.0 | 2.8 | 1.2 | -- |
| State | 7.5 | 4.0 | -- | 3.5 |
| County and municipal | 2.3 | -- | 1.2 | 1.1 |
| Farmer | 749.5 | 401.6 | 274.5 | 73.4 |
| Miscellaneous private | 408.0 | 221.4 | 139.6 | 47.0 |
| All owners | 1,207.9 | 645.6 | 428.9 | 133.4 |

[1] International 1/4-inch rule.

Table 11.--Area of commercial forest land by county and forest type, Kansas, 1981

(In thousand acres)

NORTHEASTERN UNIT

| County | All types | Forest type: Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Atchison | 23.8 | 0.6 | 9.1 | -- | 1.1 | 3.7 | 0.6 | 0.2 | 5.6 | 2.5 | 0.4 |
| Brown | 18.7 | 0.5 | 8.2 | -- | 0.8 | 2.9 | 0.1 | 0.1 | 3.4 | 2.4 | 0.3 |
| Clay | 15.3 | 0.2 | 3.4 | 0.1 | 0.8 | 2.9 | 0.8 | 0.2 | 5.1 | 1.5 | 0.3 |
| Dickinson | 13.5 | 0.1 | 3.8 | -- | 0.6 | 2.3 | 0.6 | 0.2 | 4.3 | 1.4 | 0.2 |
| Doniphan | 28.7 | 1.0 | 9.7 | -- | 1.5 | 5.1 | 0.6 | 0.4 | 6.0 | 3.7 | 0.7 |
| Douglas | 28.1 | 0.8 | 10.7 | 0.2 | 1.4 | 4.5 | 0.1 | -- | 4.4 | 5.3 | 0.7 |
| Franklin | 25.7 | 0.7 | 8.6 | 0.1 | 1.3 | 4.7 | 0.3 | 0.1 | 4.7 | 4.3 | 0.9 |
| Geary | 18.6 | 0.6 | 5.4 | -- | 1.0 | 3.1 | 0.8 | 0.1 | 4.6 | 2.5 | 0.5 |
| Jackson | 32.4 | 0.7 | 6.5 | -- | 1.1 | 9.1 | 0.7 | 0.3 | 6.2 | 5.4 | 2.4 |
| Jefferson | 41.0 | 0.7 | 15.0 | 0.2 | 2.1 | 6.6 | 0.9 | -- | 7.5 | 6.6 | 1.4 |
| Johnson | 26.0 | 0.9 | 8.5 | -- | 1.1 | 4.7 | 0.4 | 0.2 | 6.4 | 3.4 | 0.4 |
| Leavenworth | 43.3 | 0.3 | 13.5 | 0.1 | 2.2 | 7.2 | 2.4 | 0.1 | 9.4 | 5.6 | 2.5 |
| Marshall | 29.7 | 1.2 | 7.2 | 0.1 | 1.2 | 6.3 | 0.5 | 0.6 | 6.9 | 4.7 | 1.0 |
| Miami | 46.3 | 1.5 | 15.8 | -- | 1.8 | 8.3 | 0.6 | 0.3 | 10.9 | 5.9 | 1.2 |
| Nemaha | 16.3 | 0.4 | 3.3 | -- | 0.6 | 4.4 | 0.4 | 0.2 | 3.3 | 2.7 | 1.0 |
| Osage | 31.2 | 1.2 | 9.9 | 0.1 | 1.5 | 5.9 | 0.9 | 0.2 | 7.1 | 3.8 | 0.6 |
| Pottawatomie | 40.9 | 1.6 | 12.7 | 0.1 | 1.9 | 7.7 | 1.1 | 0.2 | 9.1 | 6.0 | 0.5 |
| Riley | 32.2 | 1.5 | 9.9 | 0.1 | 1.6 | 5.5 | 0.7 | 0.2 | 7.3 | 4.8 | 0.6 |
| Shawnee | 25.6 | 0.6 | 7.3 | -- | 1.0 | 5.3 | 0.5 | 0.2 | 6.1 | 3.8 | 0.8 |
| Wabaunsee | 29.3 | 0.6 | 7.4 | 0.1 | 1.4 | 6.1 | 1.3 | 0.2 | 7.7 | 3.5 | 1.0 |
| Washington | 14.3 | 0.1 | 3.3 | -- | 0.5 | 3.9 | 0.3 | 0.1 | 2.9 | 1.5 | 1.7 |
| Wyandotte | 7.2 | 0.1 | 3.5 | -- | 0.3 | 0.7 | -- | 0.1 | 1.5 | 0.8 | 0.2 |
| All counties | 588.1 | 15.9 | 182.7 | 1.2 | 26.8 | 110.9 | 14.6 | 4.2 | 130.4 | 82.1 | 19.3 |

SOUTHEASTERN UNIT

| County | All types | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Allen | 10.0 | 0.1 | 1.8 | 0.2 | 0.6 | 2.9 | 0.2 | -- | 3.3 | 0.5 | 0.4 |
| Anderson | 15.6 | 0.6 | 3.8 | 0.7 | 0.8 | 4.0 | 0.4 | -- | 3.7 | 0.9 | 0.7 |
| Bourbon | 35.1 | 1.2 | 14.9 | 3.8 | 1.3 | 5.6 | -- | -- | 5.6 | 2.0 | 0.7 |
| Butler | 21.2 | 0.1 | 3.1 | 0.2 | 1.2 | 8.1 | 0.3 | -- | 6.1 | 1.1 | 1.0 |
| Chase | 9.9 | 0.1 | 1.6 | 0.1 | 0.5 | 2.8 | 0.2 | -- | 3.9 | 0.3 | 0.4 |
| Chautauqua | 48.5 | 2.3 | 14.7 | 6.5 | 3.1 | 11.2 | 0.3 | -- | 6.2 | 2.7 | 1.5 |
| Cherokee | 22.0 | 0.2 | 5.6 | 1.9 | 1.5 | 6.2 | 0.2 | -- | 3.7 | 1.5 | 1.2 |
| Coffey | 10.0 | 0.1 | 2.9 | 0.7 | 0.7 | 2.4 | 0.1 | -- | 1.7 | 0.7 | 0.7 |
| Cowley | 25.3 | 0.3 | 4.8 | 0.6 | 1.2 | 8.7 | 0.3 | -- | 8.2 | 0.7 | 0.5 |
| Crawford | 21.8 | 0.4 | 5.2 | 0.7 | 0.9 | 6.0 | 0.5 | -- | 5.9 | 1.4 | 0.8 |
| Elk | 27.7 | 1.6 | 7.8 | 2.6 | 1.4 | 7.2 | 0.3 | -- | 4.4 | 1.5 | 0.9 |
| Greenwood | 25.2 | 0.4 | 4.4 | 0.7 | 1.5 | 7.2 | 0.9 | -- | 7.4 | 1.5 | 1.2 |
| Labette | 16.0 | 0.2 | 4.7 | 1.5 | 1.1 | 4.0 | 0.1 | -- | 2.5 | 1.1 | 0.8 |
| Linn | 48.7 | 1.7 | 19.8 | 2.3 | 1.7 | 7.8 | 0.4 | -- | 10.5 | 3.0 | 1.5 |
| Lyon | 11.2 | 0.1 | 2.2 | 0.1 | 0.6 | 3.4 | 0.1 | -- | 4.3 | 0.2 | 0.2 |
| Marion | 7.4 | 0.2 | 1.5 | 0.3 | 0.3 | 2.6 | 0.1 | -- | 1.9 | 0.3 | 0.2 |
| Montgomery | 22.9 | 0.7 | 8.9 | 1.2 | 1.0 | 3.9 | 0.1 | -- | 4.8 | 1.4 | 0.9 |
| Morris | 6.9 | 0.1 | 1.6 | 0.1 | 0.3 | 1.9 | 0.1 | -- | 2.4 | 0.2 | 0.2 |
| Neosho | 13.8 | 0.1 | 3.7 | 1.3 | 0.9 | 3.8 | 0.1 | -- | 2.3 | 1.0 | 0.6 |
| Wilson | 25.2 | 0.9 | 9.6 | 3.1 | 1.1 | 4.7 | -- | -- | 4.0 | 1.4 | 0.4 |
| Woodson | 12.6 | 0.2 | 3.5 | 1.1 | 0.9 | 3.1 | 0.2 | -- | 1.9 | 0.9 | 0.8 |
| **All counties** | 437.0 | 11.6 | 126.1 | 29.7 | 22.6 | 107.5 | 4.9 | -- | 94.7 | 24.3 | 15.6 |

(Table 11 continued)

WESTERN UNIT

| County | All types | Forest type<br>Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Elm-ash-locust | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Barber | 6.6 | -- | 0.2 | -- | -- | 2.5 | 2.1 | -- | 1.4 | 0.1 | 0.3 |
| Barton | 1.1 | -- | 0.1 | -- | -- | 0.4 | 0.3 | -- | 0.2 | -- | 0.1 |
| Cheyenne | 2.7 | -- | 0.1 | -- | -- | 0.9 | 0.9 | -- | 0.6 | 0.1 | 0.1 |
| Clark | 4.7 | -- | 0.1 | -- | -- | 1.8 | 1.8 | -- | 0.8 | -- | 0.2 |
| Cloud | 8.6 | -- | 0.6 | -- | -- | 2.5 | 2.3 | -- | 2.4 | 0.4 | 0.4 |
| Comanche | 1.0 | -- | -- | -- | -- | 0.5 | 0.2 | -- | 0.3 | -- | -- |
| Decatur | 2.3 | -- | 0.1 | -- | -- | 0.9 | 0.6 | -- | 0.5 | 0.1 | 0.1 |
| Edwards | 1.7 | -- | -- | -- | -- | 0.5 | 0.7 | -- | 0.2 | -- | 0.3 |
| Ellis | 2.7 | -- | 0.1 | -- | -- | 1.0 | 0.6 | -- | 0.8 | 0.1 | 0.1 |
| Ellsworth | 3.1 | -- | 0.2 | -- | -- | 0.9 | 0.8 | -- | 0.9 | 0.1 | 0.2 |
| Finney | 0.4 | -- | -- | -- | -- | 0.2 | 0.1 | -- | 0.1 | -- | -- |
| Ford | 0.7 | -- | -- | -- | -- | 0.4 | 0.1 | -- | 0.2 | -- | -- |
| Gove | 0.1 | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- |
| Graham | 4.7 | -- | 0.2 | -- | -- | 1.8 | 1.3 | -- | 1.1 | 0.1 | 0.2 |
| Grant | 0.1 | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- |
| Gray | 2.3 | -- | -- | -- | -- | 0.3 | 1.9 | -- | 0.1 | -- | -- |
| Greeley | 0.1 | -- | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- |
| Hamilton | 3.3 | -- | -- | -- | -- | 1.8 | 0.7 | -- | 0.5 | -- | 0.3 |
| Harper | 4.7 | -- | 0.2 | -- | -- | 2.2 | 1.1 | -- | 1.0 | 0.1 | 0.1 |
| Harvey | 1.7 | -- | -- | -- | -- | 0.9 | 0.4 | -- | 0.3 | -- | 0.1 |
| Haskell | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hodgeman | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jewell | 9.8 | -- | 0.2 | -- | -- | 4.4 | 2.5 | -- | 2.3 | 0.1 | 0.3 |
| Kearny | 0.5 | -- | -- | -- | -- | 0.2 | 0.2 | -- | 0.1 | -- | -- |
| Kingman | 7.0 | -- | 0.3 | -- | -- | 3.1 | 1.6 | -- | 1.6 | 0.2 | 0.2 |
| Kiowa | 0.6 | -- | -- | -- | -- | 0.2 | 0.1 | -- | 0.1 | -- | 0.2 |
| Lane | 0.1 | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- |
| Lincoln | 3.1 | -- | 0.2 | -- | -- | 1.0 | 0.8 | -- | 0.8 | 0.1 | 0.2 |
| Logan | 1.0 | -- | -- | -- | -- | 0.4 | 0.2 | -- | 0.2 | -- | 0.2 |
| McPherson | 3.8 | -- | 0.2 | -- | -- | 0.9 | 1.3 | -- | 0.9 | 0.1 | 0.4 |
| Meade | 1.9 | -- | -- | -- | -- | 0.7 | 0.7 | -- | 0.4 | -- | 0.1 |
| Mitchell | 7.0 | -- | 0.4 | -- | -- | 2.9 | 1.3 | -- | 1.9 | 0.2 | 0.3 |
| Morton | 2.4 | -- | -- | -- | -- | 1.1 | 0.5 | -- | 0.4 | 0.1 | 0.3 |
| Ness | 0.4 | -- | -- | -- | -- | 0.1 | 0.1 | -- | 0.1 | 0.1 | -- |
| Norton | 3.0 | -- | 0.1 | -- | -- | 1.4 | 0.7 | -- | 0.6 | -- | 0.2 |
| Osborne | 6.3 | -- | 0.4 | -- | -- | 2.3 | 1.6 | -- | 1.5 | 0.2 | 0.3 |
| Ottawa | 6.7 | -- | 0.4 | -- | -- | 2.9 | 1.2 | -- | 1.7 | 0.2 | 0.3 |
| Pawnee | 1.9 | -- | -- | -- | -- | 0.8 | 0.5 | -- | 0.5 | -- | 0.1 |
| Phillips | 6.0 | -- | 0.2 | -- | -- | 2.4 | 1.7 | -- | 1.4 | 0.1 | 0.2 |
| Pratt | 1.6 | -- | 0.1 | -- | -- | 0.4 | 0.6 | -- | 0.3 | -- | 0.2 |
| Rawlins | 2.0 | -- | 0.1 | -- | -- | 0.7 | 0.5 | -- | 0.5 | 0.1 | 0.1 |
| Reno | 6.3 | -- | 0.3 | -- | -- | 3.0 | 1.2 | -- | 1.5 | 0.1 | 0.2 |
| Republic | 8.2 | -- | 0.2 | -- | -- | 3.1 | 2.5 | -- | 1.6 | 0.1 | 0.7 |
| Rice | 1.6 | -- | 0.1 | -- | -- | 0.3 | 0.8 | -- | 0.2 | -- | 0.2 |
| Rooks | 6.4 | -- | 0.3 | -- | -- | 2.6 | 1.8 | -- | 1.3 | 0.1 | 0.3 |
| Rush | 0.1 | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- |
| Russell | 4.5 | -- | 0.3 | -- | -- | 1.3 | 1.3 | -- | 1.1 | 0.1 | 0.4 |

(Table 11 continued on next page)

(Table 11 continued)

WESTERN UNIT

| County | All types | Forest type |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Elm-ash-locust | Non-stocked |
| Saline | 3.1 | -- | 0.2 | -- | -- | 1.1 | 0.6 | -- | 1.0 | 0.1 | 0.1 |
| Scott | 0.1 | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- |
| Sedgwick | 6.8 | -- | 0.5 | -- | -- | 3.0 | 0.9 | -- | 1.9 | 0.2 | 0.3 |
| Seward | 2.0 | -- | 0.1 | -- | -- | 0.7 | 0.6 | -- | 0.5 | -- | 0.1 |
| Sheridan | 1.2 | -- | 0.1 | -- | -- | 0.4 | 0.3 | -- | 0.4 | -- | -- |
| Sherman | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Smith | 3.6 | -- | 0.1 | -- | -- | 1.5 | 0.9 | -- | 0.8 | 0.1 | 0.2 |
| Stafford | 3.5 | -- | -- | -- | -- | 0.5 | 1.8 | -- | 0.4 | -- | 0.8 |
| Stanton | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stevens | 0.6 | -- | -- | -- | -- | 0.3 | 0.1 | -- | 0.2 | -- | -- |
| Sumner | 15.2 | -- | 1.0 | -- | -- | 6.6 | 3.3 | -- | 2.8 | 0.5 | 1.0 |
| Thomas | 0.3 | -- | -- | -- | -- | 0.1 | 0.2 | -- | -- | -- | -- |
| Trego | 1.5 | -- | 0.1 | -- | -- | 0.7 | 0.2 | -- | 0.4 | -- | 0.1 |
| Wallace | 0.1 | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- |
| Wichita | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All counties | 132.8 | -- | 7.8 | -- | -- | 71.2 | 48.6 | -- | 40.8 | 3.9 | 10.5 |
| All units | 1,207.9 | 27.5 | 316.6 | 30.9 | 49.4 | 289.6 | 68.1 | 4.2 | 265.9 | 110.3 | 45.4 |

Table 12.--Area of commercial forest land by forest type and stand-age class, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Stand-age class (years) |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Eastern redcedar-hardwood | 27.5 | 12.0 | 9.0 | 1.0 | 1.6 | -- | 2.5 | -- | -- | -- | -- | -- | 1.4 | -- |
| Oak-hickory | 316.6 | 31.9 | 41.2 | 17.2 | 27.8 | 28.1 | 29.5 | 29.9 | 29.0 | 19.5 | 24.1 | 24.4 | 11.7 | 2.3 |
| Post-blackjack oak | 30.9 | 1.2 | 1.2 | 1.2 | 4.5 | 11.9 | 1.3 | 1.3 | 3.6 | 3.5 | -- | 1.2 | -- | -- |
| Upland plains hardwoods | 49.4 | 5.3 | 9.7 | 3.9 | 6.1 | 4.9 | 5.6 | 7.8 | 1.2 | 1.2 | -- | 1.2 | 2.5 | -- |
| Elm-ash-cottonwood | 289.6 | 30.5 | 62.0 | 17.5 | 22.2 | 14.5 | 39.2 | 28.8 | 28.5 | 26.9 | 13.4 | 6.1 | -- | -- |
| Cottonwood | 68.1 | 1.2 | 1.3 | 2.4 | 4.2 | 9.4 | 6.6 | 17.1 | 10.6 | 2.3 | 6.7 | 6.3 | -- | -- |
| Willow | 4.2 | 1.2 | 1.2 | .8 | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 265.9 | 21.6 | 24.9 | 13.5 | 22.6 | 10.8 | 36.0 | 47.8 | 43.7 | 14.2 | 19.9 | 8.7 | 1.2 | 1.0 |
| Upland elm-ash-locust | 110.3 | 36.8 | 34.9 | 9.9 | 10.8 | 1.2 | 3.0 | 2.4 | 4.9 | 2.2 | 2.0 | 1.0 | 1.2 | -- |
| Nonstocked | 45.4 | 13.1 | 7.5 | 7.2 | 3.8 | -- | 7.0 | 2.1 | 3.8 | .9 | -- | -- | -- | -- |
| All types | 1,207.9 | 154.8 | 192.9 | 74.6 | 103.6 | 80.8 | 131.7 | 137.2 | 125.3 | 70.7 | 66.1 | 48.9 | 18.0 | 3.3 |

Table 13.--Area of commercial forest land by forest type, stand-size class, and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Forest type | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| ALL UNITS | | | | | |
| Eastern redcedar-hardwood | 27.5 | 2.7 | 2.8 | 22.0 | -- |
| Oak-hickory | 316.6 | 141.9 | 84.0 | 90.7 | -- |
| Post-blackjack oak | 30.9 | 8.5 | 17.6 | 4.8 | -- |
| Upland plains hardwoods | 49.4 | 18.7 | 16.8 | 13.9 | -- |
| Elm-ash-cottonwood | 289.6 | 145.1 | 47.0 | 97.5 | -- |
| Cottonwood | 68.1 | 59.6 | 4.9 | 3.6 | -- |
| Willow | 4.2 | 1.0 | 0.8 | 2.4 | -- |
| Lowland plains hardwoods | 265.9 | 170.7 | 46.7 | 48.5 | -- |
| Upland elm-ash-locust | 110.3 | 16.8 | 13.8 | 79.7 | -- |
| Nonstocked | 45.4 | -- | -- | -- | 45.4 |
| All types | 1,207.9 | 565.0 | 234.4 | 363.1 | 45.4 |
| NORTHEASTERN UNIT | | | | | |
| Eastern redcedar-hardwood | 15.9 | 1.4 | 1.6 | 12.9 | -- |
| Oak-hickory | 182.7 | 74.5 | 49.9 | 58.3 | -- |
| Post-blackjack oak | 1.2 | 1.2 | -- | -- | -- |
| Upland plains hardwoods | 26.8 | 13.1 | 8.6 | 5.1 | -- |
| Elm-ash-cottonwood | 110.9 | 46.4 | 13.9 | 50.6 | -- |
| Cottonwood | 14.6 | 11.2 | 1.1 | 2.3 | -- |
| Willow | 4.2 | 1.0 | 0.8 | 2.4 | -- |
| Lowland plains hardwoods | 130.4 | 78.6 | 27.2 | 24.6 | -- |
| Upland elm-ash-locust | 82.1 | 15.6 | 9.2 | 57.3 | -- |
| Nonstocked | 19.3 | -- | -- | -- | 19.3 |
| All types | 588.1 | 243.0 | 112.3 | 213.5 | 19.3 |
| SOUTHEASTERN UNIT | | | | | |
| Eastern redcedar-hardwood | 11.6 | 1.3 | 1.2 | 9.1 | -- |
| Oak-hickory | 126.1 | 59.6 | 34.1 | 32.4 | -- |
| Post-blackjack oak | 29.7 | 7.3 | 17.6 | 4.8 | -- |
| Upland plains hardwoods | 22.6 | 5.6 | 8.2 | 8.8 | -- |
| Elm-ash-cottonwood | 107.5 | 52.3 | 17.0 | 38.2 | -- |
| Cottonwood | 4.9 | 2.3 | 1.3 | 1.3 | -- |
| Willow | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 94.7 | 62.8 | 14.7 | 17.2 | -- |
| Upland elm-ash-locust | 24.3 | 1.2 | 2.5 | 20.6 | -- |
| Nonstocked | 15.6 | -- | -- | -- | 15.6 |
| All types | 437.0 | 192.4 | 96.6 | 132.4 | 15.6 |
| WESTERN UNIT | | | | | |
| Eastern redcedar-hardwood | -- | -- | -- | -- | -- |
| Oak-hickory | 7.8 | 7.8 | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- |
| Upland plains hardwoods | -- | -- | -- | -- | -- |
| Elm-ash-cottonwood | 71.2 | 46.4 | 16.1 | 8.7 | -- |
| Cottonwood | 48.6 | 46.1 | 2.5 | -- | -- |
| Willow | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 40.8 | 29.3 | 4.8 | 6.7 | -- |
| Upland elm-ash-locust | 3.9 | -- | 2.1 | 1.8 | -- |
| Nonstocked | 10.5 | -- | -- | -- | 10.5 |
| All types | 182.8 | 129.6 | 25.5 | 17.2 | 10.5 |

Table 14.--Area of commercial forest land by forest type, stand-size class, and site class, Kansas, 1981

(In thousand acres)

| Forest type and stand-size class | All classes | Site class (cubic feet of growth/acre/year) | | | |
|---|---|---|---|---|---|
| | | 120+ | 85-119 | 50-84 | 20-49 |
| Eastern redcedar-hardwood | | | | | |
| Sawtimber | 2.7 | -- | -- | -- | 2.7 |
| Poletimber | 2.8 | -- | -- | 1.2 | 1.6 |
| Sapling & seedling | 22.0 | -- | -- | 3.4 | 18.6 |
| All stands | 27.5 | -- | -- | 4.6 | 22.9 |
| Oak-hickory | | | | | |
| Sawtimber | 141.9 | -- | 21.2 | 72.7 | 48.0 |
| Poletimber | 84.0 | -- | 11.7 | 36.8 | 35.5 |
| Sapling & seedling | 90.7 | -- | 7.4 | 34.5 | 48.8 |
| All stands | 316.6 | -- | 40.3 | 144.0 | 132.3 |
| Post-blackjack oak | | | | | |
| Sawtimber | 8.5 | -- | -- | 1.2 | 7.3 |
| Poletimber | 17.6 | -- | -- | 3.5 | 14.1 |
| Sapling & seedling | 4.8 | -- | -- | -- | 4.8 |
| All stands | 30.9 | -- | -- | 4.7 | 26.2 |
| Upland plains hardwoods | | | | | |
| Sawtimber | 18.7 | -- | 3.0 | 9.3 | 6.4 |
| Poletimber | 16.8 | -- | 4.0 | 7.2 | 5.6 |
| Sapling & seedling | 13.9 | -- | 1.2 | 2.3 | 10.4 |
| All stands | 49.4 | -- | 8.2 | 18.8 | 22.4 |
| Elm-ash-cottonwood | | | | | |
| Sawtimber | 145.1 | -- | 27.6 | 65.0 | 52.5 |
| Poletimber | 47.0 | -- | 8.9 | 17.8 | 20.3 |
| Sapling & seedling | 97.5 | -- | 9.9 | 26.4 | 61.2 |
| All stands | 289.6 | -- | 46.4 | 109.2 | 134.0 |
| Cottonwood | | | | | |
| Sawtimber | 59.6 | -- | 4.8 | 21.9 | 32.9 |
| Poletimber | 4.9 | -- | -- | -- | 4.9 |
| Sapling & seedling | 3.6 | -- | -- | -- | 3.6 |
| All stands | 68.1 | -- | 4.8 | 21.9 | 41.4 |
| Willow | | | | | |
| Sawtimber | 1.0 | -- | -- | 1.0 | -- |
| Poletimber | 0.8 | -- | -- | 0.8 | -- |
| Sapling & seedling | 2.4 | -- | -- | 1.2 | 1.2 |
| All stands | 4.2 | -- | -- | 3.0 | 1.2 |
| Lowland plains hardwoods | | | | | |
| Sawtimber | 170.7 | 2.1 | 35.5 | 100.7 | 32.4 |
| Poletimber | 46.7 | -- | 8.6 | 23.3 | 14.8 |
| Sapling & seedling | 48.5 | -- | 10.5 | 24.9 | 13.1 |
| All stands | 265.9 | 2.1 | 54.6 | 148.9 | 60.3 |
| Upland elm-ash-locust | | | | | |
| Sawtimber | 16.8 | -- | 2.1 | 3.4 | 11.3 |
| Poletimber | 13.8 | -- | -- | 2.3 | 11.5 |
| Sapling & seedling | 79.7 | -- | -- | 13.0 | 66.7 |
| All stands | 110.3 | -- | 2.1 | 18.7 | 89.5 |
| Nonstocked | 45.4 | -- | 2.5 | 11.7 | 31.2 |
| All types | | | | | |
| Sawtimber | 565.0 | 2.1 | 94.2 | 275.2 | 193.5 |
| Poletimber | 234.4 | -- | 33.2 | 92.9 | 108.3 |
| Sapling & seedling | 363.1 | -- | 29.0 | 105.7 | 228.4 |
| Nonstocked | 45.4 | -- | 2.5 | 11.7 | 31.2 |
| All stands | 1,207.9 | 2.1 | 158.9 | 485.5 | 561.4 |

Table 15.--Area of commercial forest land by forest type, stand-size class, and stocking percent, Kansas, 1981

(In thousand acres)

| Forest type and stand-size class | All classes | Stocking percent of growing-stock trees: Less than 16.7 | 16.7-60 | 61-100 | 101-133 | 134+ |
|---|---|---|---|---|---|---|
| Eastern redcedar-hardwood | | | | | | |
| Sawtimber | 2.7 | -- | -- | 2.7 | -- | -- |
| Poletimber | 2.8 | -- | 1.6 | 1.2 | -- | -- |
| Sapling & seedling | 22.0 | -- | 14.4 | 6.4 | 1.2 | -- |
| All stands | 27.5 | -- | 16.0 | 10.3 | 1.2 | -- |
| Oak-hickory | | | | | | |
| Sawtimber | 141.9 | -- | 48.4 | 77.2 | 16.3 | -- |
| Poletimber | 84.0 | -- | 20.6 | 49.4 | 14.0 | -- |
| Sapling & seedling | 90.7 | -- | 40.1 | 42.5 | 8.1 | -- |
| All stands | 316.6 | -- | 109.1 | 169.1 | 38.4 | -- |
| Post-blackjack oak | | | | | | |
| Sawtimber | 8.5 | -- | 2.5 | 6.0 | -- | -- |
| Poletimber | 17.6 | -- | 2.5 | 12.8 | 2.3 | -- |
| Sapling & seedling | 4.8 | -- | 3.6 | -- | 1.2 | -- |
| All stands | 30.9 | -- | 8.6 | 18.8 | 3.5 | -- |
| Upland plains hardwoods | | | | | | |
| Sawtimber | 18.7 | -- | 11.0 | 7.7 | -- | -- |
| Poletimber | 16.8 | -- | 11.3 | 5.5 | -- | -- |
| Sapling & seedling | 13.9 | -- | 6.5 | 7.4 | -- | -- |
| All stands | 49.4 | -- | 28.8 | 20.6 | -- | -- |
| Elm-ash-cottonwood | | | | | | |
| Sawtimber | 145.1 | 1.6 | 61.2 | 67.4 | 14.9 | -- |
| Poletimber | 47.0 | -- | 26.2 | 20.8 | -- | -- |
| Sapling & seedling | 97.5 | -- | 59.9 | 35.1 | 2.5 | -- |
| All stands | 289.6 | 1.6 | 147.3 | 123.3 | 17.4 | -- |
| Cottonwood | | | | | | |
| Sawtimber | 59.6 | -- | 19.4 | 23.9 | 16.3 | -- |
| Poletimber | 4.9 | -- | 1.3 | 3.6 | -- | -- |
| Sapling & seedling | 3.6 | -- | 1.3 | 1.2 | 1.1 | -- |
| All stands | 68.1 | -- | 22.0 | 28.7 | 17.4 | -- |
| Willow | | | | | | |
| Sawtimber | 1.0 | 1.0 | -- | -- | -- | -- |
| Poletimber | 0.8 | -- | 0.8 | -- | -- | -- |
| Sapling & seedling | 2.4 | -- | 1.2 | -- | 1.2 | -- |
| All stands | 4.2 | 1.0 | 2.0 | -- | 1.2 | -- |
| Lowland plains hardwoods | | | | | | |
| Sawtimber | 170.7 | -- | 64.9 | 92.3 | 13.5 | -- |
| Poletimber | 46.7 | -- | 21.7 | 25.0 | -- | -- |
| Sapling & seedling | 48.5 | 1.3 | 25.7 | 21.5 | -- | -- |
| All stands | 265.9 | 1.3 | 112.3 | 138.8 | 13.5 | -- |
| Upland elm-ash-locust | | | | | | |
| Sawtimber | 16.8 | -- | 11.3 | 4.5 | 1.0 | -- |
| Poletimber | 13.8 | -- | 9.1 | 4.7 | -- | -- |
| Sapling & seedling | 79.7 | 1.4 | 51.5 | 25.4 | 1.4 | -- |
| All stands | 110.3 | 1.4 | 71.9 | 34.6 | 2.4 | -- |
| Nonstocked | 45.4 | 45.4 | -- | -- | -- | -- |
| All types | | | | | | |
| Sawtimber | 565.0 | 2.6 | 218.7 | 281.7 | 62.0 | -- |
| Poletimber | 234.4 | -- | 95.1 | 123.0 | 16.3 | -- |
| Sapling & seedling | 363.1 | 2.7 | 204.2 | 139.5 | 16.7 | -- |
| Nonstocked | 45.4 | 45.4 | -- | -- | -- | -- |
| All stands | 1,207.9 | 50.7 | 518.0 | 544.2 | 95.0 | -- |

Table 16.--Area of commercial forest land by forest type, site-index class, and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| ALL UNITS | | | | | | | | | |
| Eastern redcedar-hardwood | 27.5 | 1.9 | 10.0 | 6.0 | 4.9 | 4.7 | -- | -- | -- |
| Oak-hickory | 316.6 | -- | 20.4 | 58.6 | 109.4 | 63.1 | 45.5 | 12.9 | 6.7 |
| Post-blackjack oak | 30.9 | -- | 8.3 | 11.9 | 8.3 | 1.2 | 1.2 | -- | -- |
| Upland plains hardwoods | 49.4 | -- | 1.2 | 2.2 | 19.0 | 11.6 | 8.4 | 5.8 | 1.2 |
| Elm-ash-cottonwood | 289.6 | -- | 3.5 | 22.1 | 60.4 | 90.2 | 67.1 | 36.4 | 9.9 |
| Cottonwood | 68.1 | -- | -- | 9.3 | 13.8 | 25.0 | 15.1 | 3.7 | 1.2 |
| Willow | 4.2 | -- | -- | 1.2 | -- | 1.0 | 2.0 | -- | -- |
| Lowland plains hardwoods | 265.9 | -- | 7.6 | 12.4 | 40.4 | 94.8 | 70.8 | 35.7 | 4.2 |
| Upland elm-ash-locust | 110.3 | -- | 8.2 | 28.9 | 37.5 | 20.7 | 12.9 | 2.1 | -- |
| Nonstocked | 45.4 | -- | 3.9 | 11.3 | 9.8 | 14.3 | 3.6 | 2.5 | -- |
| All types | 1,207.9 | 1.9 | 63.1 | 163.9 | 303.5 | 326.6 | 226.6 | 99.1 | 23.2 |
| NORTHEASTERN UNIT | | | | | | | | | |
| Eastern redcedar-hardwood | 15.9 | 1.9 | 7.2 | 3.1 | 2.7 | 1.0 | -- | -- | -- |
| Oak-hickory | 182.7 | -- | 7.0 | 41.2 | 63.0 | 30.8 | 29.0 | 7.9 | 3.8 |
| Post-blackjack oak | 1.2 | -- | 1.2 | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 26.8 | -- | -- | 0.6 | 14.1 | 4.6 | 5.0 | 2.5 | -- |
| Elm-ash-cottonwood | 110.9 | -- | 3.5 | 18.4 | 23.5 | 18.4 | 28.7 | 15.6 | 2.8 |
| Cottonwood | 14.6 | -- | -- | 1.2 | 2.2 | 3.9 | 2.4 | 3.7 | 1.2 |
| Willow | 4.2 | -- | -- | 1.2 | -- | 1.0 | 2.0 | -- | -- |
| Lowland plains hardwoods | 130.4 | -- | 4.1 | 5.8 | 23.2 | 39.3 | 39.0 | 17.0 | 2.0 |
| Upland elm-ash-locust | 82.1 | -- | 7.0 | 26.0 | 23.2 | 13.4 | 10.4 | 2.1 | -- |
| Nonstocked | 19.3 | -- | 2.4 | 8.8 | 2.0 | 4.6 | 1.5 | -- | -- |
| All types | 588.1 | 1.9 | 32.4 | 106.3 | 153.9 | 117.0 | 118.0 | 48.8 | 9.8 |
| SOUTHEASTERN UNIT | | | | | | | | | |
| Eastern redcedar-hardwood | 11.6 | -- | 2.8 | 2.9 | 2.2 | 3.7 | -- | -- | -- |
| Oak-hickory | 126.1 | -- | 13.4 | 17.4 | 42.5 | 28.4 | 16.5 | 5.0 | 2.9 |
| Post-blackjack oak | 29.7 | -- | 7.1 | 11.9 | 8.3 | 1.2 | 1.2 | -- | -- |
| Upland plains hardwoods | 22.6 | -- | 1.2 | 1.6 | 4.9 | 7.0 | 3.4 | 3.3 | 1.2 |
| Elm-ash-cottonwood | 107.5 | -- | -- | 3.7 | 19.4 | 40.3 | 21.5 | 15.5 | 7.1 |
| Cottonwood | 4.9 | -- | -- | 1.3 | -- | 2.6 | 1.0 | -- | -- |
| Willow | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 94.7 | -- | -- | 3.9 | 10.7 | 43.1 | 21.4 | 13.4 | 2.2 |
| Upland elm-ash-locust | 24.3 | -- | 1.2 | 2.9 | 10.4 | 7.3 | 2.5 | -- | -- |
| Nonstocked | 15.6 | -- | 1.5 | 2.5 | 4.1 | 5.0 | -- | 2.5 | -- |
| All types | 437.0 | -- | 27.2 | 48.1 | 102.5 | 138.6 | 67.5 | 39.7 | 13.4 |
| WESTERN UNIT | | | | | | | | | |
| Eastern redcedar-hardwood | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 7.8 | -- | -- | -- | 3.9 | 3.9 | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm-ash-cottonwood | 71.2 | -- | -- | -- | 17.5 | 31.5 | 16.9 | 5.3 | -- |
| Cottonwood | 48.6 | -- | -- | 6.8 | 11.6 | 18.5 | 11.7 | -- | -- |
| Willow | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 40.8 | -- | 3.5 | 2.7 | 6.5 | 12.4 | 10.4 | 5.3 | -- |
| Upland elm-ash-locust | 3.9 | -- | -- | -- | 3.9 | -- | -- | -- | -- |
| Nonstocked | 10.5 | -- | -- | -- | 3.7 | 4.7 | 2.1 | -- | -- |
| All types | 182.8 | -- | 3.5 | 9.5 | 47.1 | 71.0 | 41.1 | 10.6 | -- |

Table 17.--Area of commercial forest land by forest type and basal-area class, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Basal-area class (square feet per acre) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-20 | 21-40 | 41-60 | 51-80 | 81-100 | 101-120 | 121-140 | 141-160 | 161-180 | 181+ |
| Eastern redcedar-hardwood | 27.5 | 6.5 | 8.1 | 7.5 | 2.8 | -- | 2.6 | -- | -- | -- | -- |
| Oak-hickory | 316.6 | 13.9 | 42.4 | 83.5 | 78.3 | 60.6 | 30.6 | 4.6 | 2.7 | -- | -- |
| Post-blackjack oak | 30.9 | -- | 2.4 | 3.7 | 10.8 | 9.3 | 3.6 | 1.1 | -- | -- | -- |
| Upland plains hardwoods | 49.4 | -- | 5.4 | 16.2 | 12.0 | 11.2 | 2.5 | 1.1 | -- | -- | -- |
| Elm-ash-cottonwood | 289.6 | 11.5 | 49.7 | 88.9 | 56.8 | 31.0 | 34.3 | 8.5 | 3.0 | 5.9 | -- |
| Cottonwood | 68.1 | 1.8 | 4.7 | 16.6 | 10.0 | 10.0 | 9.2 | 5.7 | 6.0 | -- | 4.1 |
| Willow | 4.2 | 1.2 | 0.8 | 1.2 | -- | -- | 1.0 | -- | -- | -- | -- |
| Lowland plains hardwoods | 265.9 | 3.5 | 36.6 | 63.3 | 65.1 | 47.3 | 40.5 | 9.6 | -- | -- | -- |
| Upland elm-ash-locust | 110.3 | 27.6 | 29.3 | 24.2 | 19.6 | 8.4 | 1.2 | -- | -- | -- | -- |
| Nonstocked | 45.4 | 19.9 | 9.8 | 14.7 | 1.0 | -- | -- | -- | -- | -- | -- |
| All types | 1,207.9 | 85.9 | 190.2 | 319.8 | 256.4 | 177.8 | 125.5 | 30.6 | 11.7 | 5.9 | 4.1 |

Table 18.--Area of commercial forest land by forest type and distance to road[1], Kansas, 1981

(In thousand acres)

| Forest type | All distances | Distance to road (miles) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0-1/8 | 1/8-1/4 | 1/4-1 | 1-2 1/2 | 2 1/2-5 | 5-10 | 10-20 | 20+ |
| Eastern redcedar-hardwood | 27.5 | 2.8 | 7.4 | 15.7 | 1.6 | -- | -- | -- | -- |
| Oak-hickory | 316.6 | 60.0 | 81.3 | 169.5 | 2.5 | 3.3 | -- | -- | -- |
| Post-blackjack oak | 30.9 | 4.8 | 8.5 | 15.2 | -- | 2.4 | -- | -- | -- |
| Upland plains hardwoods | 49.4 | 15.8 | 11.4 | 17.8 | -- | 4.4 | -- | -- | -- |
| Elm-ash-cottonwood | 289.6 | 62.2 | 90.5 | 124.8 | 2.3 | 3.5 | -- | 6.3 | -- |
| Cottonwood | 68.1 | 7.1 | 24.6 | 33.0 | 3.4 | -- | -- | -- | -- |
| Willow | 4.2 | -- | 3.0 | 1.2 | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 265.9 | 50.4 | 90.0 | 117.5 | 7.0 | -- | -- | 1.0 | -- |
| Upland elm-ash-locust | 110.3 | 28.2 | 34.0 | 42.1 | 2.5 | 2.5 | -- | 1.0 | -- |
| Nonstocked | 45.4 | 8.9 | 13.1 | 23.4 | -- | -- | -- | -- | -- |
| All types | 1,207.9 | 240.2 | 363.8 | 560.2 | 19.3 | 16.1 | -- | 8.3 | -- |

---

[1] A permanent road that is maintained at least once a year.

Table 19.--Area of commercial forest land by forest type and distance to water[1], Kansas, 1981

(In thousand acres)

| Forest type | All distances | Distance to water (miles) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 0-1/8 | 1/8-1/4 | 1/4-1 | 1-2 1/2 | 2 1/2-5 | 5-10 | 10-20 | 20+ |
| Eastern redcedar-hardwood | 27.5 | 2.8 | 2.5 | 4.9 | 7.3 | 1.4 | -- | -- | 8.1 |
| Oak-hickory | 316.6 | 28.5 | 20.5 | 74.4 | 74.0 | 41.6 | 20.2 | 22.3 | 35.1 |
| Post-blackjack oak | 30.9 | 1.2 | 4.6 | 4.7 | 8.4 | 4.7 | 2.4 | 3.7 | 1.2 |
| Upland plains hardwoods | 49.4 | 2.3 | 3.6 | 6.1 | 6.0 | 9.6 | 8.8 | 6.5 | 6.5 |
| Elm-ash-cottonwood | 289.6 | 56.2 | 20.1 | 35.9 | 42.8 | 27.1 | 31.2 | 28.5 | 47.8 |
| Cottonwood | 68.1 | 19.1 | 8.0 | 9.6 | 3.6 | 2.9 | 5.3 | 6.9 | 12.7 |
| Willow | 4.2 | 1.0 | -- | 1.2 | 0.8 | 1.2 | -- | -- | -- |
| Lowland plains hardwoods | 265.9 | 44.9 | 11.9 | 36.3 | 37.2 | 47.4 | 31.2 | 31.1 | 25.9 |
| Upland elm-ash-locust | 110.3 | 9.9 | 8.6 | 22.1 | 26.6 | 23.6 | 4.4 | 3.6 | 11.5 |
| Nonstocked | 45.4 | 3.5 | 1.2 | 6.0 | 4.4 | 8.1 | 3.1 | 3.9 | 10.2 |
| All types | 1,207.9 | 169.4 | 81.0 | 201.2 | 211.6 | 167.6 | 106.6 | 111.5 | 159.0 |

[1] Lakes or ponds 5 acres or larger in area, and streams or rivers at least 66 feet in width.

Table 20.--Area of commercial forest land by forest type and stand-area class, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Stand-area class (acres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-4 | 5-9 | 10-19 | 20-39 | 40-79 | 80-159 | 160-319 | 320-639 | 640+ |
| Eastern redcedar-hardwood | 27.5 | 3.5 | 10.2 | 5.8 | 3.6 | -- | 4.4 | -- | -- | -- |
| Oak-hickory | 316.6 | 33.1 | 67.7 | 94.7 | 43.6 | 40.8 | 17.2 | 8.3 | 9.3 | 1.9 |
| Post-blackjack oak | 30.9 | 1.2 | 4.9 | 7.0 | 7.2 | 3.7 | 3.5 | 3.4 | -- | -- |
| Upland plains hardwoods | 49.4 | 6.8 | 7.3 | 21.2 | 10.2 | 2.7 | 0 | 1.2 | -- | -- |
| Elm-ash-cottonwood | 289.6 | 74.1 | 83.6 | 66.7 | 34.9 | 13.7 | 8.7 | 5.5 | 1.1 | 1.3 |
| Cottonwood | 68.1 | 24.5 | 10.6 | 11.2 | 12.2 | 3.3 | 1.1 | 3.9 | -- | 1.3 |
| Willow | 4.2 | 0.8 | 1.2 | 1.2 | 1.0 | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 265.9 | 57.4 | 72.7 | 74.5 | 33.0 | 17.7 | 10.6 | -- | -- | -- |
| Upland elm-ash-locust | 110.3 | 27.6 | 30.5 | 19.8 | 16.8 | 9.6 | 6.0 | -- | -- | -- |
| Nonstocked | 45.4 | 14.8 | 15.5 | 7.6 | -- | 1.2 | 1.2 | 5.1 | -- | -- |
| All types | 1,207.9 | 243.8 | 304.2 | 309.7 | 162.5 | 92.7 | 52.7 | 27.4 | 10.4 | 4.5 |

Table 21.--Area of commercial forest land by stocking class based on selected stand components, Kansas, 1981

(In thousand acres)

| Stocking percentage | All live trees | Stocking classified in terms of | | | |
|---|---|---|---|---|---|
| | | Growing-stock trees | Desirable trees | Acceptable trees | Rough and rotten trees |
| 0-10 | 2.7 | 19.5 | 1,163.2 | 19.5 | 175.3 |
| 11-20 | 2.5 | 43.9 | 36.2 | 46.1 | 271.3 |
| 21-30 | 12.4 | 71.8 | 5.0 | 79.9 | 281.0 |
| 31-40 | 22.1 | 143.6 | 2.2 | 148.4 | 217.7 |
| 41-50 | 51.5 | 134.9 | -- | 144.3 | 133.5 |
| 51-60 | 81.8 | 155.1 | 1.3 | 155.6 | 61.8 |
| 61-70 | 95.6 | 166.7 | -- | 175.1 | 43.7 |
| 71-80 | 119.0 | 155.0 | -- | 150.2 | 20.3 |
| 81-90 | 176.5 | 129.9 | -- | 124.2 | 2.1 |
| 91-100 | 187.4 | 91.5 | -- | 87.5 | 1.2 |
| 101-110 | 154.8 | 52.5 | -- | 38.6 | -- |
| 111-120 | 149.3 | 25.8 | -- | 23.1 | -- |
| 121-130 | 82.4 | 16.7 | -- | 14.4 | -- |
| 131-140 | 48.6 | -- | -- | -- | -- |
| 141-150 | 19.5 | -- | -- | -- | -- |
| 151-160 | 1.8 | -- | -- | -- | -- |
| 161+ | -- | -- | -- | -- | -- |
| Total | 1,207.9 | 1,207.9 | 1,207.9 | 1,207.9 | 1,207.9 |

Table 22.--Area of commercial forest land by forest type, physiographic class, and ownership class, Kansas,1981

(In thousand acres)

| Forest type and physiographic class | All classes | Ownership class | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | National Forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
| Eastern redcedar-hardwood | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 2.4 | -- | -- | -- | -- | -- | 2.4 | -- |
| Xeromesic | 25.1 | -- | 1.6 | -- | -- | -- | 16.3 | 7.2 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 27.5 | -- | 1.6 | -- | -- | -- | 18.7 | 7.2 |
| Oak-hickory | | | | | | | | |
| Hydric | 2.6 | -- | -- | -- | -- | -- | 2.6 | -- |
| Hydromesic | 7.6 | -- | -- | -- | -- | -- | 4.2 | 3.4 |
| Mesic | 132.7 | -- | 0.9 | 1.2 | 2.6 | -- | 76.7 | 51.3 |
| Xeromesic | 155.5 | -- | 5.9 | -- | -- | -- | 88.5 | 61.1 |
| Xeric | 18.2 | -- | -- | -- | -- | -- | 12.4 | 5.8 |
| All classes | 316.6 | -- | 6.8 | 1.2 | 2.6 | -- | 184.4 | 121.6 |
| Post-blackjack oak | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 1.2 | -- | -- | -- | -- | -- | 1.2 | -- |
| Mesic | 9.8 | -- | -- | -- | -- | -- | 8.5 | 1.3 |
| Xeromesic | 17.6 | -- | 1.2 | -- | -- | -- | 11.7 | 4.7 |
| Xeric | 2.3 | -- | -- | -- | -- | -- | 1.1 | 1.2 |
| All classes | 30.9 | -- | 1.2 | -- | -- | -- | 22.5 | 7.2 |
| Upland plains hardwoods | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 1.2 | -- | -- | -- | -- | -- | 1.2 | -- |
| Xeromesic | 46.5 | -- | 2.5 | -- | -- | 1.1 | 23.9 | 19.0 |
| Xeric | 1.7 | -- | -- | -- | -- | -- | 1.7 | -- |
| All classes | 49.4 | -- | 2.5 | -- | -- | 1.1 | 26.8 | 19.0 |
| Elm-ash-cottonwood | | | | | | | | |
| Hydric | 9.0 | -- | -- | -- | -- | -- | 2.3 | 6.7 |
| Hydromesic | 77.1 | -- | 3.3 | -- | 1.0 | -- | 49.6 | 23.2 |
| Mesic | 203.5 | -- | 5.3 | 1.6 | -- | 1.2 | 130.3 | 65.1 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 289.6 | -- | 8.6 | 1.6 | 1.0 | 1.2 | 182.2 | 95.0 |
| Cottonwood | | | | | | | | |
| Hydric | 3.9 | -- | -- | -- | -- | -- | -- | 3.9 |
| Hydromesic | 20.2 | -- | 3.0 | -- | 2.5 | -- | 6.9 | 7.8 |
| Mesic | 29.9 | -- | -- | -- | -- | -- | 16.3 | 13.6 |
| Xeromesic | 6.9 | -- | -- | -- | -- | -- | 4.8 | 2.1 |
| Xeric | 7.2 | -- | -- | -- | -- | -- | 7.2 | -- |
| All classes | 68.1 | -- | 3.0 | -- | 2.5 | -- | 35.2 | 27.4 |

(Table 22 continued on next page)

(Table 22 continued)

| Forest type and physiographic class | All classes | Ownership class<br>National Forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
|---|---|---|---|---|---|---|---|---|
| Willow | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 3.4 | -- | -- | -- | -- | -- | 1.0 | 2.4 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | 0.8 | -- | -- | -- | -- | -- | -- | 0.8 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 4.2 | -- | -- | -- | -- | -- | 1.0 | 3.2 |
| Lowland plains hardwoods | | | | | | | | |
| Hydric | 2.5 | -- | -- | -- | -- | -- | 2.5 | -- |
| Hydromesic | 52.3 | -- | 2.7 | -- | -- | -- | 31.6 | 18.0 |
| Mesic | 211.1 | -- | 4.4 | -- | -- | -- | 152.5 | 54.2 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 265.9 | -- | 7.1 | -- | -- | -- | 186.6 | 72.2 |
| Upland elm-ash-locust | | | | | | | | |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | 100.5 | -- | 5.8 | 1.2 | -- | -- | 54.7 | 38.8 |
| Xeric | 9.8 | -- | -- | -- | -- | -- | 8.8 | 1.0 |
| All classes | 110.3 | -- | 5.8 | 1.2 | -- | -- | 63.5 | 39.8 |
| Nonstocked | | | | | | | | |
| Hydric | 9.1 | -- | -- | -- | 1.4 | -- | -- | 7.7 |
| Hydromesic | 3.0 | -- | -- | -- | -- | -- | 3.0 | -- |
| Mesic | 11.5 | -- | -- | -- | -- | -- | 7.7 | 3.8 |
| Xeromesic | 19.7 | -- | -- | -- | -- | -- | 15.8 | 3.9 |
| Xeric | 2.1 | -- | -- | -- | -- | -- | 2.1 | -- |
| All classes | 45.4 | -- | -- | -- | 1.4 | -- | 28.6 | 15.4 |
| All types | | | | | | | | |
| Hydric | 27.1 | -- | -- | -- | 1.4 | -- | 7.4 | 18.3 |
| Hydromesic | 164.8 | -- | 9.0 | -- | 3.5 | -- | 97.5 | 54.8 |
| Mesic | 602.1 | -- | 10.6 | 2.8 | 2.6 | 1.2 | 395.6 | 189.3 |
| Xeromesic | 372.6 | -- | 17.0 | 1.2 | -- | 1.1 | 215.7 | 137.6 |
| Xeric | 41.3 | -- | -- | -- | -- | -- | 33.3 | 8.0 |
| All classes | 1,207.9 | -- | 36.6 | 4.0 | 7.5 | 2.3 | 749.5 | 408.0 |

Table 23.--Area of noncommercial forest land by ownership class, Kansas, 1981

(In thousand acres)

| Ownership class | Total | Unproductive | Productive-reserved |
|---|---|---|---|
| National Forest | -- | -- | -- |
| Miscellaneous federal | 13.8 | -- | 13.8 |
| Indian | -- | -- | -- |
| State | 2.8 | -- | 2.8 |
| County and municipal | 4.8 | -- | 4.8 |
| Farmer | 89.1 | 89.1 | -- |
| Miscellaneous private | 40.3 | 39.3 | 1.0 |
| All owners | 150.8 | 128.4 | 22.4 |

Table 24.--Area of noncommercial forest land by forest type and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Forest type | Total | Unproductive | Productive-reserved |
|---|---|---|---|
| ALL UNITS | | | |
| Eastern redcedar-hardwood | 24.6 | 17.1 | 7.5 |
| Oak-hickory | 23.1 | 13.2 | 9.9 |
| Post-blackjack oak | 76.0 | 76.0 | -- |
| Upland plains hardwoods | 8.8 | 8.8 | -- |
| Elm-ash-cottonwood | 7.8 | 5.3 | 2.5 |
| Cottonwood | 2.5 | -- | 2.5 |
| Willow | -- | -- | -- |
| Lowland plains hardwoods | 1.0 | 1.0 | -- |
| Upland elm-ash-locust | 6.0 | 6.0 | -- |
| Nonstocked | 1.0 | 1.0 | -- |
| All types | 150.8 | 128.4 | 22.4 |
| NORTHEASTERN UNIT | | | |
| Eastern redcedar-hardwood | 19.0 | 11.5 | 7.5 |
| Oak-hickory | 7.6 | -- | 7.6 |
| Post-blackjack oak | 2.4 | 2.4 | -- |
| Upland plains hardwoods | 2.3 | 2.3 | -- |
| Elm-ash-cottonwood | -- | -- | -- |
| Cottonwood | -- | -- | -- |
| Willow | -- | -- | -- |
| Lowland plains hardwoods | -- | -- | -- |
| Upland elm-ash-locust | 3.8 | 3.8 | -- |
| Nonstocked | 1.0 | 1.0 | -- |
| All types | 36.1 | 21.0 | 15.1 |
| SOUTHEASTERN UNIT | | | |
| Eastern redcedar-hardwood | 2.4 | 2.4 | -- |
| Oak-hickory | 12.0 | 9.7 | 2.3 |
| Post-blackjack oak | 73.6 | 73.6 | -- |
| Upland plains hardwoods | 6.5 | 6.5 | -- |
| Elm-ash-cottonwood | 1.6 | 1.6 | -- |
| Cottonwood | -- | -- | -- |
| Willow | -- | -- | -- |
| Lowland plains hardwoods | 1.0 | 1.0 | -- |
| Upland elm-ash-locust | 2.2 | 2.2 | -- |
| Nonstocked | -- | -- | -- |
| All types | 99.3 | 97.0 | 2.3 |
| WESTERN UNIT | | | |
| Eastern redcedar-hardwood | 3.2 | 3.2 | -- |
| Oak-hickory | 3.5 | 3.5 | -- |
| Post-blackjack oak | -- | -- | -- |
| Upland plains hardwoods | -- | -- | -- |
| Elm-ash-cottonwood | 6.2 | 3.7 | 2.5 |
| Cottonwood | 2.5 | -- | 2.5 |
| Willow | -- | -- | -- |
| Lowland plains hardwoods | -- | -- | -- |
| Upland elm-ash-locust | -- | -- | -- |
| Nonstocked | -- | -- | -- |
| All types | 15.4 | 10.4 | 5.0 |

Table 25.--Area of nonforest land with trees by land use, forest type, and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Land use | All types | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Forest type | | | | | | | | | |
| ALL UNITS | | | | | | | | | | | |
| Cropland | 63.0 | -- | 4.1 | 2.7 | 1.3 | 27.4 | 1.6 | -- | 10.0 | 7.3 | 8.6 |
| Improved pasture | 533.5 | 26.4 | 24.4 | 11.7 | 11.7 | 122.4 | 13.5 | -- | 15.1 | 190.0 | 113.4 |
| Wooded strips | 150.0 | 5.3 | 4.8 | -- | 6.4 | 51.6 | 5.1 | 2.0 | 49.9 | 5.6 | 19.3 |
| Idle farmland | 23.9 | -- | -- | -- | -- | 18.0 | -- | -- | 1.3 | 1.4 | 3.2 |
| Marsh | 22.7 | -- | -- | -- | -- | 8.6 | 1.1 | 1.4 | 0.9 | -- | 10.7 |
| Windbreaks | 185.3 | 9.3 | 1.4 | -- | 4.3 | 48.9 | 3.2 | -- | 1.4 | 117.3 | -- |
| Wooded pasture | 209.3 | 13.3 | 12.7 | -- | 11.1 | 55.4 | 8.9 | -- | 10.0 | 14.5 | 83.9 |
| All uses | 1,189.3 | 54.9 | 47.4 | 14.4 | 34.8 | 332.3 | 33.4 | 3.4 | 88.6 | 336.1 | 244.1 |
| NORTHEASTERN UNIT | | | | | | | | | | | |
| Cropland | 30.2 | -- | 4.1 | -- | -- | 5.2 | 1.6 | -- | 7.0 | 5.9 | 5.4 |
| Improved pasture | 139.4 | 9.9 | 14.8 | -- | 5.4 | 29.4 | -- | -- | 3.8 | 51.7 | 24.4 |
| Wooded strips | 62.6 | 1.9 | 1.2 | -- | 3.9 | 22.3 | -- | 1.0 | 21.4 | 2.9 | 8.0 |
| Idle farmland | 4.1 | -- | -- | -- | -- | 2.7 | -- | -- | -- | 1.4 | -- |
| Marsh | 4.2 | -- | -- | -- | -- | 0.8 | 1.1 | 1.4 | 0.9 | -- | -- |
| Windbreaks | 43.0 | 2.9 | 1.4 | -- | 3.0 | 6.1 | -- | -- | 1.4 | 28.2 | -- |
| Wooded pasture | 60.5 | 3.4 | 6.3 | -- | 2.3 | 13.8 | -- | -- | 3.0 | 4.5 | 27.2 |
| All uses | 344.0 | 18.1 | 27.8 | -- | 14.6 | 81.3 | 2.7 | 2.4 | 37.5 | 94.6 | 65.0 |
| SOUTHEASTERN UNIT | | | | | | | | | | | |
| Cropland | 13.6 | -- | -- | 2.7 | 1.3 | 5.2 | -- | -- | 3.0 | 1.4 | -- |
| Improved pasture | 225.2 | 7.3 | 9.6 | 11.7 | 6.3 | 37.3 | 1.4 | -- | 8.1 | 112.1 | 31.4 |
| Wooded strips | 50.3 | -- | 3.6 | -- | 2.5 | 13.6 | -- | 1.0 | 18.9 | 2.7 | 8.0 |
| Idle farmland | 2.5 | -- | -- | -- | -- | 1.2 | -- | -- | 1.3 | -- | -- |
| Marsh | 4.3 | -- | -- | -- | -- | 4.3 | -- | -- | -- | -- | -- |
| Windbreaks | 66.9 | -- | -- | -- | 1.3 | 5.9 | -- | -- | -- | 59.7 | -- |
| Wooded pasture | 95.2 | 6.7 | 6.4 | -- | 5.2 | 20.1 | -- | -- | 7.0 | 10.0 | 38.8 |
| All uses | 458.0 | 14.0 | 19.6 | 14.4 | 17.6 | 87.6 | 1.4 | 1.0 | 38.3 | 185.9 | 78.2 |
| WESTERN UNIT | | | | | | | | | | | |
| Cropland | 19.2 | -- | -- | -- | -- | 16.0 | -- | -- | -- | -- | 3.2 |
| Improved pasture | 169.0 | 9.2 | -- | -- | -- | 55.7 | 12.1 | -- | 3.2 | 26.2 | 62.6 |
| Wooded strips | 37.1 | 3.4 | -- | -- | -- | 15.7 | 5.1 | -- | 9.6 | -- | 3.3 |
| Idle farmland | 17.3 | -- | -- | -- | -- | 14.1 | -- | -- | -- | -- | 3.2 |
| Marsh | 14.2 | -- | -- | -- | -- | 3.5 | -- | -- | -- | -- | 10.7 |
| Windbreaks | 76.4 | 6.9 | -- | -- | -- | 36.9 | 3.2 | -- | -- | 29.4 | -- |
| Wooded pasture | 54.1 | 3.2 | -- | -- | 2.6 | 21.5 | 8.9 | -- | -- | -- | 17.9 |
| All uses | 387.3 | 22.7 | -- | -- | 2.6 | 163.4 | 29.3 | -- | 12.8 | 55.6 | 100.9 |

Table 26.--Area of nonforest land with trees by forest type and stand-size class, Kansas, 1981

(In thousand acres)

| Forest type | All stands | Stand-size class: Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
|---|---|---|---|---|---|
| Eastern redcedar-hardwood | 54.8 | -- | 16.8 | 38.0 | -- |
| Oak-hickory | 47.4 | 14.5 | 14.7 | 18.2 | -- |
| Post-blackjack oak | 14.4 | 1.3 | 6.2 | 6.9 | -- |
| Upland plains hardwoods | 34.8 | 8.8 | 11.0 | 15.0 | -- |
| Elm-ash-cottonwood | 332.3 | 51.8 | 144.3 | 136.2 | -- |
| Cottonwood | 33.4 | 23.8 | 9.6 | -- | -- |
| Willow | 3.4 | -- | 2.4 | 1.0 | -- |
| Lowland plains hardwoods | 88.6 | 18.7 | 40.4 | 29.5 | -- |
| Upland elm-ash-locust | 336.1 | 24.6 | 157.4 | 154.1 | -- |
| Nonstocked | 244.1 | -- | -- | -- | 244.1 |
| All types | 1,189.3 | 143.5 | 402.8 | 398.9 | 244.1 |

Table 27.--Area of windbreaks by forest type, stand-size class, and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Forest type | All stands | Stand-size class | | | |
|---|---|---|---|---|---|
| | | Sawtimber stands | Poletimber stands | Sapling and seedling stands | Nonstocked areas |
| | | ALL UNITS | | | |
| Eastern redcedar-hardwood | 9.8 | -- | 6.9 | 2.9 | -- |
| Oak-hickory | 1.4 | -- | 1.4 | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 4.3 | 1.6 | 2.7 | -- | -- |
| Elm-ash-cottonwood | 48.8 | 3.3 | 39.1 | 6.4 | -- |
| Cottonwood | 3.2 | -- | 3.2 | -- | -- |
| Willow | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 1.4 | -- | 1.4 | -- | -- |
| Upland elm-ash-locust | 117.4 | 11.4 | 87.0 | 19.0 | -- |
| Nonstocked | -- | -- | -- | -- | -- |
| All types | 186.3 | 16.3 | 141.7 | 28.3 | -- |
| | | NORTHEASTERN UNIT | | | |
| Eastern redcedar-hardwood | 2.9 | -- | -- | 2.9 | -- |
| Oak-hickory | 1.4 | -- | 1.4 | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 3.0 | 1.6 | 1.4 | -- | -- |
| Elm-ash-cottonwood | 6.0 | -- | 4.5 | 1.5 | -- |
| Cottonwood | -- | -- | -- | -- | -- |
| Willow | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 1.4 | -- | 1.4 | -- | -- |
| Upland elm-ash-locust | 28.3 | 2.8 | 19.8 | 5.7 | -- |
| Nonstocked | -- | -- | -- | -- | -- |
| All types | 43.0 | 4.4 | 28.5 | 10.1 | -- |
| | | SOUTHEASTERN UNIT | | | |
| Eastern redcedar-hardwood | -- | -- | -- | -- | -- |
| Oak-hickory | -- | -- | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 1.3 | -- | 1.3 | -- | -- |
| Elm-ash-cottonwood | 5.9 | -- | 4.2 | 1.7 | -- |
| Cottonwood | -- | -- | -- | -- | -- |
| Willow | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | -- | -- | -- | -- | -- |
| Upland elm-ash-locust | 59.7 | 1.3 | 48.3 | 10.1 | -- |
| Nonstocked | -- | -- | -- | -- | -- |
| All types | 66.9 | 1.3 | 53.8 | 11.8 | -- |
| | | WESTERN UNIT | | | |
| Eastern redcedar-hardwood | 6.9 | -- | 6.9 | -- | -- |
| Oak-hickory | -- | -- | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- |
| Upland plains hardwoods | -- | -- | -- | -- | -- |
| Elm-ash-cottonwood | 36.9 | 3.3 | 30.4 | 3.2 | -- |
| Cottonwood | 3.2 | -- | 3.2 | -- | -- |
| Willow | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | -- | -- | -- | -- | -- |
| Upland elm-ash-locust | 29.4 | 7.3 | 18.9 | 3.2 | -- |
| Nonstocked | -- | -- | -- | -- | -- |
| All types | 76.4 | 10.6 | 59.4 | 6.4 | -- |

Table 28.--Area of wooded strips by forest type, stand-size class, and ownership class, Kansas, 1981

(In thousand acres)

| Forest type and stand-size class | All classes | Ownership class: National Forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
|---|---|---|---|---|---|---|---|---|
| Eastern redcedar-hardwood | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 3.4 | -- | -- | -- | -- | -- | 3.4 | -- |
| Sapling & seedling | 1.9 | -- | -- | -- | -- | -- | 1.9 | -- |
| All stands | 5.3 | -- | -- | -- | -- | -- | 5.3 | -- |
| Oak-hickory | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2.4 | -- | -- | -- | -- | -- | 2.4 | -- |
| Sapling & seedling | 2.7 | -- | -- | -- | -- | -- | 2.7 | -- |
| All stands | 5.1 | -- | -- | -- | -- | -- | 5.1 | -- |
| Post-blackjack oak | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 2.8 | -- | -- | -- | -- | -- | 2.8 | -- |
| Sapling & seedling | 3.6 | -- | -- | -- | -- | -- | 2.0 | 1.6 |
| All stands | 6.4 | -- | -- | -- | -- | -- | 4.8 | 1.6 |
| Elm-ash-cottonwood | | | | | | | | |
| Sawtimber | 4.6 | -- | 1.3 | -- | -- | -- | 3.3 | -- |
| Poletimber | 24.1 | -- | 3.3 | -- | -- | -- | 17.8 | 3.0 |
| Sapling & seedling | 23.1 | -- | -- | -- | -- | -- | 17.4 | 5.7 |
| All stands | 51.8 | -- | 4.6 | -- | -- | -- | 38.5 | 8.7 |
| Cottonwood | | | | | | | | |
| Sawtimber | 2.5 | -- | -- | -- | -- | -- | 2.5 | -- |
| Poletimber | 2.6 | -- | -- | -- | -- | -- | -- | 2.6 |
| Sapling & seedling | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 5.1 | -- | -- | -- | -- | -- | 2.5 | 2.6 |
| Willow | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- |
| Sapling & seedling | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- |
| All stands | 2.0 | -- | -- | -- | -- | -- | 2.0 | -- |
| Lowland plains hardwoods | | | | | | | | |
| Sawtimber | 6.8 | -- | -- | -- | -- | -- | 3.7 | 3.1 |
| Poletimber | 13.5 | -- | -- | -- | -- | -- | 12.1 | 1.4 |
| Sapling & seedling | 14.9 | -- | -- | -- | -- | -- | 13.9 | 1.0 |
| All stands | 35.2 | -- | -- | -- | -- | -- | 29.7 | 5.5 |
| Upland elm-ash-locust | | | | | | | | |
| Sawtimber | 1.4 | -- | -- | -- | -- | -- | -- | 1.4 |
| Poletimber | 8.1 | -- | -- | -- | -- | -- | 6.6 | 1.5 |
| Sapling & seedling | 10.4 | -- | 1.2 | -- | -- | -- | 4.0 | 5.2 |
| All stands | 19.9 | -- | 1.2 | -- | -- | -- | 10.6 | 8.1 |
| Nonstocked | 19.2 | -- | -- | -- | -- | -- | 16.1 | 3.1 |
| All types | | | | | | | | |
| Sawtimber | 15.3 | -- | 1.3 | -- | -- | -- | 9.5 | 4.5 |
| Poletimber | 57.9 | -- | 3.3 | -- | -- | -- | 46.1 | 8.5 |
| Sapling & seedling | 57.6 | -- | 1.2 | -- | -- | -- | 42.9 | 13.5 |
| Nonstocked | 19.2 | -- | -- | -- | -- | -- | 16.1 | 3.1 |
| All stands | 150.0 | -- | 5.8 | -- | -- | -- | 114.6 | 29.6 |

Table 29.--Area of wooded strips by forest type and site-index class, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Site-index class (feet) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91+ |
| Eastern redcedar-hardwood | 5.3 | -- | -- | 1.9 | 3.4 | -- | -- | -- | -- |
| Oak-hickory | 5.1 | -- | -- | 2.4 | -- | 2.7 | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 6.4 | -- | -- | 5.5 | -- | -- | 0.9 | -- | -- |
| Elm-ash-cottonwood | 51.8 | -- | 1.2 | 19.2 | 9.9 | 15.3 | 1.5 | 4.7 | -- |
| Cottonwood | 5.1 | -- | -- | 2.5 | 2.6 | -- | -- | -- | -- |
| Willow | 2.0 | -- | -- | 1.0 | -- | -- | -- | 1.0 | -- |
| Lowland plains hardwoods | 35.2 | -- | -- | 20.5 | 4.7 | 7.2 | 1.4 | 1.4 | -- |
| Upland elm-ash-locust | 19.9 | -- | -- | 9.6 | 6.6 | 3.7 | -- | -- | -- |
| Nonstocked | 19.2 | -- | -- | 10.4 | 4.7 | 3.1 | 1.0 | -- | -- |
| All types | 150.0 | -- | 1.2 | 73.0 | 31.9 | 32.0 | 4.8 | 7.1 | -- |

## Table 30.--Area of wooded strips by forest type, basal-area class, and Forest Survey Unit, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Basal-area class (square feet per acre) 0-20 | 21-40 | 41-60 | 61-80 | 81-100 | 101-120 | 121-140 | 141-160 | 161-180 | 181+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ALL UNITS | | | | | |
| Eastern redcedar-hardwood | 5.3 | -- | 1.9 | -- | -- | -- | -- | -- | -- | -- | 3.4 |
| Oak-hickory | 5.1 | 1.2 | 1.5 | -- | 1.2 | -- | -- | -- | -- | 1.2 | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 6.4 | -- | 1.4 | 1.6 | 0.9 | 1.4 | -- | 1.1 | -- | -- | -- |
| Elm-ash-cottonwood | 51.8 | 1.4 | 10.1 | 5.5 | 12.5 | 3.6 | 4.0 | 8.6 | 4.2 | 1.0 | 0.9 |
| Cottonwood | 5.1 | -- | -- | -- | -- | 2.5 | -- | -- | -- | -- | 2.6 |
| Willow | 2.0 | -- | -- | -- | -- | -- | 1.0 | -- | -- | 1.0 | -- |
| Lowland plains hardwoods | 35.2 | 3.0 | 6.1 | 2.5 | 8.8 | 4.0 | 6.5 | 1.4 | -- | 2.9 | -- |
| Upland elm-ash-locust | 19.9 | -- | 3.9 | 5.2 | 5.5 | 2.4 | -- | 1.4 | -- | -- | 1.5 |
| Nonstocked | 19.2 | 3.8 | 5.5 | -- | 5.5 | 1.4 | 1.4 | 1.6 | -- | -- | -- |
| All types | 150.0 | 9.4 | 30.4 | 14.8 | 34.4 | 15.3 | 12.9 | 14.1 | 4.2 | 6.1 | 8.4 |
| | | | | | | NORTHEASTERN UNIT | | | | | |
| Eastern redcedar-hardwood | 1.9 | -- | 1.9 | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 2.4 | 1.2 | -- | -- | 1.2 | -- | -- | -- | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 3.9 | -- | -- | 1.6 | 0.9 | 1.4 | -- | -- | -- | -- | -- |
| Elm-ash-cottonwood | 18.0 | 1.4 | 1.4 | 4.1 | 5.6 | -- | 2.7 | 1.0 | 0.9 | -- | 0.9 |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Willow | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- | -- | -- | -- |
| Lowland plains hardwoods | 16.4 | 0.9 | 1.2 | 1.2 | 4.7 | 1.6 | 3.9 | -- | -- | 2.9 | -- |
| Upland elm-ash-locust | 11.1 | -- | 1.4 | 2.7 | 4.1 | -- | -- | 1.4 | -- | -- | 1.5 |
| Nonstocked | 7.9 | 2.4 | 1.4 | -- | 1.1 | 1.4 | -- | 1.6 | -- | -- | -- |
| All types | 62.6 | 5.9 | 7.3 | 9.6 | 17.6 | 4.4 | 7.6 | 4.0 | 0.9 | 2.9 | 2.4 |
| | | | | | | SOUTHEASTERN UNIT | | | | | |
| Eastern redcedar-hardwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 2.7 | -- | 1.5 | -- | -- | -- | -- | -- | -- | 1.2 | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 2.5 | -- | 1.4 | -- | -- | -- | -- | 1.1 | -- | -- | -- |
| Elm-ash-cottonwood | 16.1 | -- | 5.5 | 1.4 | 3.5 | 3.6 | -- | 1.1 | -- | 1.0 | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Willow | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | 1.0 | -- |
| Lowland plains hardwoods | 13.7 | 2.1 | 2.4 | 1.3 | 4.1 | 2.4 | -- | 1.4 | -- | -- | -- |
| Upland elm-ash-locust | 6.3 | -- | 2.5 | -- | 1.4 | 2.4 | -- | -- | -- | -- | -- |
| Nonstocked | 8.0 | 1.4 | 4.1 | -- | 1.1 | -- | 1.4 | -- | -- | -- | -- |
| All types | 50.3 | 3.5 | 17.4 | 2.7 | 10.1 | 8.4 | 1.4 | 3.6 | -- | 3.2 | -- |
| | | | | | | WESTERN UNIT | | | | | |
| Eastern redcedar-hardwood | 3.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.4 |
| Oak-hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm-ash-cottonwood | 17.7 | -- | 3.2 | -- | 3.4 | -- | 1.3 | 6.5 | 3.3 | -- | -- |
| Cottonwood | 5.1 | -- | -- | -- | -- | 2.5 | -- | -- | -- | -- | 2.6 |
| Willow | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 5.1 | -- | 2.5 | -- | -- | -- | 2.6 | -- | -- | -- | -- |
| Upland elm-ash-locust | 2.5 | -- | -- | 2.5 | -- | -- | -- | -- | -- | -- | -- |
| Nonstocked | 3.3 | -- | -- | -- | 3.3 | -- | -- | -- | -- | -- | -- |
| All types | 37.1 | -- | 5.7 | 2.5 | 6.7 | 2.5 | 3.9 | 6.5 | 3.3 | | 6.0 |

Table 31.--Area of wooded strips by forest type and stand-age class, Kansas, 1981

(In thousand acres)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101+ |
| Eastern redcedar-hardwood | 5.3 | -- | 1.9 | 3.4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Oak-hickory | 5.1 | 1.2 | 1.5 | -- | -- | 2.4 | -- | -- | -- | -- | -- | -- |
| Post-blackjack oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Upland plains hardwoods | 6.4 | -- | 3.6 | -- | 1.4 | -- | 1.4 | -- | -- | -- | -- | -- |
| Elm-ash-cottonwood | 51.8 | 6.1 | 17.1 | 10.2 | 4.8 | 5.1 | 2.1 | 3.2 | 3.2 | -- | -- | -- |
| Cottonwood | 5.1 | -- | 2.5 | -- | -- | -- | -- | 2.6 | -- | -- | -- | -- |
| Willow | 2.0 | 1.0 | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 35.2 | 8.5 | 7.8 | 3.8 | 5.4 | 2.8 | 2.6 | 2.7 | 1.6 | -- | -- | -- |
| Upland elm-ash-locust | 19.9 | 3.0 | 3.9 | 3.8 | 5.3 | -- | -- | 2.5 | -- | 1.4 | -- | -- |
| Nonstocked | 19.2 | 5.3 | 4.1 | 2.4 | -- | -- | 3.0 | 3.3 | -- | -- | 1.1 | -- |
| All types | 150.0 | 25.1 | 42.4 | 23.6 | 17.9 | 10.3 | 9.1 | 14.3 | 4.8 | 1.4 | 1.1 | -- |

Table 32.--Area of wooded strips by forest type, physiographic class, and ownership class, Kansas, 1981

(In thousand acres)

| Forest type and physiographic class | All classes | Ownership class |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | National Forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
| **Eastern redcedar-hardwood** |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | 5.3 | -- | -- | -- | -- | -- | 5.3 | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 5.3 | -- | -- | -- | -- | -- | 5.3 | -- |
| **Oak-hickory** |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 1.5 | -- | -- | -- | -- | -- | 1.5 | -- |
| Mesic | 3.6 | -- | -- | -- | -- | -- | 3.6 | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 5.1 | -- | -- | -- | -- | -- | 5.1 | -- |
| **Post-blackjack oak** |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | -- | -- | -- | -- | -- | -- | -- | -- |
| **Upland plains hardwoods** |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 1.4 | -- | -- | -- | -- | -- | 1.4 | -- |
| Xeromesic | 5.0 | -- | -- | -- | -- | -- | 3.4 | 1.6 |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 6.4 | -- | -- | -- | -- | -- | 4.8 | 1.6 |
| **Elm-ash-cottonwood** |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 12.9 | -- | 3.3 | -- | -- | -- | 5.0 | 4.6 |
| Mesic | 38.9 | -- | 1.3 | -- | -- | -- | 33.5 | 4.1 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 51.8 | -- | 4.6 | -- | -- | -- | 38.5 | 8.7 |
| **Cottonwood** |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 2.6 | -- | -- | -- | -- | -- | -- | 2.6 |
| Mesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeromesic | 2.5 | -- | -- | -- | -- | -- | 2.5 | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 5.1 | -- | -- | -- | -- | -- | 2.5 | 2.6 |

(Table 32 continued on next page)

(Table 32 continued)

| Forest type and physiographic class | All classes | Ownership class |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | National Forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
| Willow |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- |
| Mesic | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 2.0 | -- | -- | -- | -- | -- | 2.0 | -- |
| Lowland plains hardwoods |  |  |  |  |  |  |  |  |
| Hydric | 1.4 | -- | -- | -- | -- | -- | 1.4 | -- |
| Hydromesic | 10.9 | -- | -- | -- | -- | -- | 10.0 | 0.9 |
| Mesic | 22.9 | -- | -- | -- | -- | -- | 18.3 | 4.6 |
| Xeromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 35.2 | -- | -- | -- | -- | -- | 29.7 | 5.5 |
| Upland elm-ash-locust |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | -- | -- | -- | -- | -- | -- | -- | -- |
| Mesic | 1.5 | -- | -- | -- | -- | -- | -- | 1.5 |
| Xeromesic | 15.6 | -- | 1.2 | -- | -- | -- | 7.8 | 6.6 |
| Xeric | 2.8 | -- | -- | -- | -- | -- | 2.8 | -- |
| All classes | 19.9 | -- | 1.2 | -- | -- | -- | 10.6 | 8.1 |
| Nonstocked |  |  |  |  |  |  |  |  |
| Hydric | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydromesic | 1.4 | -- | -- | -- | -- | -- | 1.4 | -- |
| Mesic | 10.8 | -- | -- | -- | -- | -- | 7.7 | 3.1 |
| Xeromesic | 7.0 | -- | -- | -- | -- | -- | 7.0 | -- |
| Xeric | -- | -- | -- | -- | -- | -- | -- | -- |
| All classes | 19.2 | -- | -- | -- | -- | -- | 16.1 | 3.1 |
| All types |  |  |  |  |  |  |  |  |
| Hydric | 1.4 | -- | -- | -- | -- | -- | 1.4 | -- |
| Hydromesic | 30.3 | -- | 3.3 | -- | -- | -- | 18.9 | 8.1 |
| Mesic | 80.1 | -- | 1.3 | -- | -- | -- | 65.5 | 13.3 |
| Xeromesic | 35.4 | -- | 1.2 | -- | -- | -- | 26.0 | 8.2 |
| Xeric | 2.8 | -- | -- | -- | -- | -- | 2.8 | -- |
| All classes | 150.0 | -- | 5.8 | -- | -- | -- | 114.6 | 29.6 |

Table 33.--Area of wooded strips in private ownership by ownership class, owner tenure, and ownership size class, Kansas, 1981

(In thousand acres)

ALL UNITS

| Ownership class and owner tenure | All classes | Ownership size class (acres) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1-5 | 5-10 | 10-20 | 20-50 | 50-100 | 100-500 | 500+ |
| Farmer | | | | | | | | |
| 1-4 years | 14.2 | -- | 3.7 | 5.1 | 1.0 | 4.4 | -- | -- |
| 5-9 years | 19.3 | 3.3 | 4.1 | 6.2 | 2.9 | 2.8 | -- | -- |
| 10-19 years | 24.5 | -- | 8.2 | 7.9 | 7.1 | 1.3 | -- | -- |
| 20+ years | 56.7 | 1.6 | 25.9 | 15.9 | 8.7 | 2.4 | 2.2 | -- |
| Total | 114.7 | 4.9 | 41.9 | 35.1 | 19.7 | 10.9 | 2.2 | -- |
| Miscellaneous private corporation | | | | | | | | |
| 1-4 years | 1.4 | -- | 1.4 | -- | -- | -- | -- | -- |
| 5-9 years | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 2.4 | -- | 1.4 | -- | -- | -- | 1.0 | -- |
| Miscellaneous private individual | | | | | | | | |
| 1-4 years | 3.7 | -- | -- | 2.3 | 1.4 | -- | -- | -- |
| 5-9 years | 4.4 | 3.0 | 1.4 | -- | -- | -- | -- | -- |
| 10-19 years | 5.2 | 0.9 | -- | 4.3 | -- | -- | -- | -- |
| 20+ years | 13.8 | 1.4 | 2.5 | 7.3 | -- | 1.6 | 1.0 | -- |
| Total | 27.1 | 5.3 | 3.9 | 13.9 | 1.4 | 1.6 | 1.0 | -- |
| All owners | | | | | | | | |
| 1-4 years | 19.3 | -- | 5.1 | 7.4 | 2.4 | 4.4 | -- | -- |
| 5-9 years | 24.7 | 6.3 | 5.5 | 6.2 | 2.9 | 2.8 | 1.0 | -- |
| 10-19 years | 29.7 | 0.9 | 8.2 | 12.2 | 7.1 | 1.3 | -- | -- |
| 20+ years | 70.5 | 3.0 | 28.4 | 23.2 | 8.7 | 4.0 | 3.2 | -- |
| Total | 144.2 | 10.2 | 47.2 | 49.0 | 21.1 | 12.5 | 4.2 | -- |

NORTHEASTERN UNIT

| Ownership class and owner tenure | All classes | 1-5 | 5-10 | 10-20 | 20-50 | 50-100 | 100-500 | 500+ |
|---|---|---|---|---|---|---|---|---|
| Farmer | | | | | | | | |
| 1-4 years | 7.1 | -- | 1.5 | 1.2 | -- | 4.4 | -- | -- |
| 5-9 years | 11.4 | -- | 2.7 | 4.6 | 2.9 | 1.2 | -- | -- |
| 10-19 years | 12.1 | -- | 5.6 | 2.9 | 3.6 | -- | -- | -- |
| 20+ years | 18.5 | 1.6 | 5.5 | 5.0 | 4.2 | -- | 2.2 | -- |
| Total | 49.1 | 1.6 | 15.3 | 13.7 | 10.7 | 5.6 | 2.2 | -- |
| Miscellaneous private corporation | | | | | | | | |
| 1-4 years | 1.4 | -- | 1.4 | -- | -- | -- | -- | -- |
| 5-9 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1.4 | -- | 1.4 | -- | -- | -- | -- | -- |
| Miscellaneous private individual | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | 3.0 | 3.0 | -- | -- | -- | -- | -- | -- |
| 10-19 years | 2.5 | 0.9 | -- | 1.6 | -- | -- | -- | -- |
| 20+ years | 6.6 | 1.4 | -- | 2.6 | -- | 1.6 | 1.0 | -- |
| Total | 12.1 | 5.3 | -- | 4.2 | -- | 1.6 | 1.0 | -- |
| All owners | | | | | | | | |
| 1-4 years | 8.5 | -- | 2.9 | 1.2 | -- | 4.4 | -- | -- |
| 5-9 years | 14.4 | 3.0 | 2.7 | 4.6 | 2.9 | 1.2 | -- | -- |
| 10-19 years | 14.6 | 0.9 | 5.6 | 4.5 | 3.6 | -- | -- | -- |
| 20+ years | 25.1 | 3.0 | 5.5 | 7.5 | 4.2 | 1.6 | 3.2 | -- |
| Total | 62.6 | 6.9 | 16.7 | 17.9 | 10.7 | 7.2 | 3.2 | -- |

(Table 33 continued on next page)

(Table 33 continued)

| Ownership class and owner tenure | All classes | Ownership size class (acres) 1-5 | 5-10 | 10-20 | 20-50 | 50-100 | 100-500 | 500+ |
|---|---|---|---|---|---|---|---|---|
| SOUTHEASTERN UNIT | | | | | | | | |
| Farmer | | | | | | | | |
| 1-4 years | 7.1 | -- | 2.2 | 3.9 | 1.0 | -- | -- | -- |
| 5-9 years | 4.6 | -- | 1.4 | 1.6 | -- | 1.6 | -- | -- |
| 10-19 years | 12.4 | -- | 2.6 | 5.0 | 3.5 | 1.3 | -- | -- |
| 20+ years | 13.4 | -- | 2.4 | 7.5 | 1.1 | 2.4 | -- | -- |
| Total | 37.5 | — | 8.6 | 18.0 | 5.6 | 5.3 | -- | -- |
| Miscellaneous private corporation | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | 1.0 | -- | -- | -- | -- | -- | 1.0 | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1.0 | — | -- | -- | -- | -- | 1.0 | -- |
| Miscellaneous private individual | | | | | | | | |
| 1-4 years | 3.7 | -- | -- | 2.3 | 1.4 | -- | -- | -- |
| 5-9 years | 1.4 | -- | 1.4 | -- | -- | -- | -- | -- |
| 10-19 years | 2.7 | -- | -- | 2.7 | -- | -- | -- | -- |
| 20+ years | 1.4 | -- | -- | 1.4 | -- | -- | -- | -- |
| Total | 9.2 | -- | 1.4 | 6.4 | 1.4 | -- | -- | -- |
| All owners | | | | | | | | |
| 1-4 years | 10.8 | -- | 2.2 | 6.2 | 2.4 | -- | -- | -- |
| 5-9 years | 7.0 | -- | 2.8 | 1.6 | -- | 1.6 | 1.0 | -- |
| 10-19 years | 15.1 | -- | 2.6 | 7.7 | 3.5 | 1.3 | -- | -- |
| 20+ years | 14.8 | -- | 2.4 | 8.9 | 1.1 | 2.4 | -- | -- |
| Total | 47.7 | -- | 10.0 | 24.4 | 7.0 | 5.3 | 1.0 | -- |
| WESTERN UNIT | | | | | | | | |
| Farmer | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | 3.3 | 3.3 | -- | -- | -- | -- | -- | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | 24.8 | -- | 18.0 | 3.4 | 3.4 | -- | -- | -- |
| Total | 28.1 | 3.3 | 18.0 | 3.4 | 3.4 | -- | -- | -- |
| Miscellaneous private corporation | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | -- | -- | -- | -- | -- | -- | -- | -- |
| Miscellaneous private individual | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | 5.8 | -- | 2.5 | 3.3 | -- | -- | -- | -- |
| Total | 5.8 | -- | 2.5 | 3.3 | -- | -- | -- | -- |
| All owners | | | | | | | | |
| 1-4 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 5-9 years | 3.3 | 3.3 | -- | -- | -- | -- | -- | -- |
| 10-19 years | -- | -- | -- | -- | -- | -- | -- | -- |
| 20+ years | 30.6 | -- | 20.5 | 6.7 | 3.4 | -- | -- | -- |
| Total | 33.9 | 3.3 | 20.5 | 6.7 | 3.4 | -- | -- | -- |

Table 34.--Number of all live trees on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| Eastern redcedar | 8,560 | 4,553 | 2,393 | 997 | 408 | 84 | 69 | 39 | 10 | 2 | 5 | -- | -- | -- | -- |
| Total | 8,560 | 4,553 | 2,393 | 997 | 408 | 84 | 69 | 39 | 10 | 2 | 5 | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | | | |
| Bur oak | 8,760 | 3,323 | 1,100 | 1,133 | 715 | 524 | 332 | 288 | 299 | 264 | 209 | 198 | 279 | 88 | 8 |
| Select white oak | 13,569 | 2,932 | 3,198 | 2,463 | 1,908 | 1,460 | 702 | 346 | 253 | 125 | 81 | 44 | 49 | 7 | 1 |
| Other white oak | 13,305 | 2,334 | 5,017 | 3,098 | 1,409 | 809 | 294 | 187 | 87 | 48 | 6 | 10 | 6 | -- | -- |
| Select red oak | 8,696 | 2,420 | 1,904 | 899 | 950 | 795 | 647 | 322 | 265 | 167 | 141 | 63 | 92 | 28 | 3 |
| Other red oak | 7,875 | 2,964 | 1,327 | 1,253 | 866 | 460 | 346 | 184 | 133 | 105 | 79 | 59 | 78 | 19 | 2 |
| Select hickory | 14,239 | 8,299 | 2,237 | 1,960 | 899 | 362 | 198 | 151 | 61 | 49 | 15 | 4 | 4 | -- | -- |
| Other hickory | 12,579 | 6,802 | 2,943 | 1,474 | 730 | 378 | 150 | 66 | 12 | 11 | 7 | 3 | 3 | -- | -- |
| Pecan | 2,783 | 832 | 937 | 317 | 220 | 204 | 107 | 69 | 37 | 23 | 13 | 15 | 5 | 4 | -- |
| Hard maple | 4,477 | 2,872 | 944 | 260 | 235 | 88 | 51 | 19 | 2 | 2 | 2 | 1 | -- | 1 | -- |
| Soft maple | 3,209 | 1,322 | 505 | 292 | 279 | 194 | 122 | 150 | 98 | 78 | 47 | 36 | 60 | 20 | 6 |
| Ash | 38,977 | 19,576 | 8,911 | 4,173 | 2,791 | 1,445 | 681 | 545 | 306 | 246 | 110 | 70 | 117 | 6 | -- |
| Cottonwood | 8,576 | 1,834 | 366 | 1,215 | 997 | 1,085 | 816 | 658 | 452 | 269 | 252 | 107 | 303 | 158 | 64 |
| Basswood | 5,162 | 3,681 | 643 | 259 | 171 | 136 | 108 | 70 | 38 | 21 | 19 | 9 | 6 | 1 | -- |
| Elm | 98,365 | 67,331 | 19,142 | 6,684 | 2,684 | 1,202 | 542 | 297 | 161 | 111 | 69 | 43 | 84 | 14 | 1 |
| Black walnut | 27,581 | 10,664 | 6,161 | 4,485 | 2,085 | 1,833 | 1,077 | 639 | 356 | 153 | 64 | 44 | 16 | 4 | -- |
| Willow | 5,094 | 2,517 | 904 | 466 | 332 | 238 | 245 | 153 | 94 | 60 | 45 | 19 | 19 | 1 | 1 |
| Boxelder | 12,941 | 5,172 | 2,862 | 2,087 | 1,144 | 660 | 436 | 197 | 159 | 108 | 44 | 30 | 32 | 9 | 1 |
| Hackberry | 54,901 | 28,513 | 12,848 | 5,238 | 3,149 | 1,943 | 1,215 | 762 | 538 | 303 | 174 | 105 | 87 | 26 | -- |
| Sycamore | 2,315 | 798 | 567 | 140 | 207 | 108 | 106 | 73 | 96 | 51 | 37 | 39 | 55 | 31 | 7 |
| Other hardwoods | 53,074 | 27,537 | 11,647 | 6,665 | 3,286 | 1,583 | 1,023 | 547 | 336 | 185 | 122 | 60 | 64 | 18 | 1 |
| Noncommercial species | 58,163 | 35,575 | 13,691 | 4,894 | 2,160 | 926 | 498 | 177 | 117 | 60 | 25 | 17 | 20 | 3 | -- |
| Total | 454,641 | 237,298 | 97,854 | 49,455 | 27,217 | 16,433 | 9,696 | 5,900 | 3,900 | 2,439 | 1,561 | 976 | 1,379 | 438 | 95 |
| All species | 463,201 | 241,851 | 100,247 | 50,452 | 27,625 | 16,517 | 9,765 | 5,939 | 3,910 | 2,441 | 1,566 | 976 | 1,379 | 438 | 95 |

Table 35.--Number of growing-stock trees on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0-2.9 | 3.0-4.9 | 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | | | | | |
| Eastern redcedar | 7,926 | 4,430 | 2,255 | 766 | 314 | 66 | 63 | 22 | 3 | 2 | 5 | -- | -- | -- | -- |
| Total | 7,926 | 4,430 | 2,255 | 766 | 314 | 66 | 63 | 22 | 3 | 2 | 5 | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | | | |
| Bur oak | 6,707 | 2,504 | 894 | 868 | 527 | 422 | 221 | 225 | 233 | 208 | 172 | 152 | 212 | 65 | 4 |
| Select white oak | 7,626 | 1,856 | 1,804 | 1,198 | 922 | 809 | 428 | 242 | 174 | 82 | 52 | 24 | 30 | 5 | -- |
| Other white oak | 10,252 | 1,502 | 4,174 | 2,347 | 1,108 | 666 | 179 | 163 | 67 | 34 | 4 | 5 | 3 | -- | -- |
| Select red oak | 6,987 | 1,944 | 1,520 | 656 | 834 | 683 | 524 | 226 | 214 | 141 | 108 | 40 | 77 | 13 | 2 |
| Other red oak | 5,659 | 2,140 | 994 | 819 | 584 | 389 | 216 | 154 | 92 | 77 | 67 | 50 | 61 | 15 | 1 |
| Select hickory | 11,987 | 6,884 | 2,025 | 1,601 | 750 | 347 | 156 | 117 | 53 | 42 | 8 | 1 | 3 | -- | -- |
| Other hickory | 10,375 | 5,310 | 2,704 | 1,270 | 550 | 339 | 107 | 62 | 12 | 11 | 7 | 3 | -- | -- | -- |
| Pecan | 2,198 | 707 | 684 | 204 | 207 | 185 | 89 | 50 | 27 | 18 | 8 | 11 | 4 | 4 | -- |
| Hard maple | 3,605 | 2,360 | 683 | 198 | 211 | 81 | 45 | 19 | 2 | 2 | 2 | 1 | -- | 1 | -- |
| Soft maple | 2,071 | 797 | 226 | 177 | 258 | 141 | 87 | 116 | 84 | 63 | 38 | 28 | 43 | 10 | 3 |
| Ash | 31,604 | 16,178 | 7,589 | 3,029 | 2,202 | 1,149 | 482 | 388 | 216 | 168 | 74 | 42 | 82 | 5 | -- |
| Cottonwood | 7,574 | 1,581 | 366 | 1,168 | 798 | 972 | 675 | 577 | 417 | 250 | 230 | 88 | 278 | 131 | 43 |
| Basswood | 3,105 | 2,115 | 432 | 198 | 86 | 72 | 79 | 59 | 26 | 19 | 7 | 9 | 3 | -- | -- |
| Elm | 73,418 | 53,415 | 13,971 | 3,427 | 1,410 | 620 | 196 | 169 | 73 | 42 | 29 | 25 | 35 | 6 | -- |
| Black walnut | 22,281 | 8,778 | 4,961 | 3,572 | 1,602 | 1,537 | 839 | 517 | 266 | 126 | 41 | 31 | 8 | 3 | -- |
| Willow | 4,236 | 2,275 | 904 | 316 | 205 | 132 | 147 | 104 | 66 | 40 | 24 | 12 | 10 | -- | 1 |
| Boxelder | 7,033 | 3,507 | 1,487 | 948 | 584 | 201 | 164 | 67 | 38 | 26 | 6 | 3 | 2 | -- | -- |
| Hackberry | 42,443 | 22,043 | 10,313 | 3,884 | 2,257 | 1,497 | 896 | 584 | 430 | 241 | 130 | 82 | 67 | 19 | -- |
| Sycamore | 2,010 | 798 | 449 | 112 | 135 | 73 | 94 | 64 | 93 | 47 | 31 | 39 | 45 | 24 | 6 |
| Other hardwoods | 30,305 | 17,739 | 7,006 | 2,560 | 1,315 | 724 | 387 | 227 | 154 | 102 | 46 | 25 | 16 | 4 | -- |
| Total | 291,476 | 154,433 | 63,186 | 28,552 | 16,545 | 11,039 | 6,011 | 4,130 | 2,737 | 1,739 | 1,084 | 671 | 979 | 310 | 60 |
| All species | 299,402 | 158,863 | 65,441 | 29,318 | 16,859 | 11,105 | 6,074 | 4,152 | 2,740 | 1,741 | 1,089 | 671 | 979 | 310 | 60 |

Table 36.--Number of short-log trees on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand trees)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| Eastern redcedar | 140 | 67 | 53 | 7 | -- | 9 | 4 | -- | -- | -- | -- | -- | -- |
| Total | 140 | 67 | 53 | 7 | -- | 9 | 4 | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Bur oak | 419 | 135 | 32 | 65 | 53 | 24 | 23 | 24 | 6 | 16 | 28 | 11 | 2 |
| Select white oak | 791 | 217 | 196 | 195 | 92 | 33 | 30 | 11 | 5 | 4 | 7 | 1 | -- |
| Other white oak | 581 | 324 | 126 | 69 | 57 | -- | 3 | -- | -- | -- | 2 | -- | -- |
| Select red oak | 274 | 80 | 62 | 39 | 39 | 35 | 10 | -- | 4 | 2 | 2 | 1 | -- |
| Other red oak | 435 | 136 | 148 | 47 | 71 | 8 | 16 | 7 | -- | -- | 2 | -- | -- |
| Select hickory | 252 | 153 | 68 | 6 | -- | 17 | 2 | -- | 4 | 2 | -- | -- | -- |
| Other hickory | 233 | 122 | 55 | 32 | 18 | 4 | -- | -- | -- | -- | 2 | -- | -- |
| Pecan | 65 | 25 | 13 | -- | 5 | 8 | 3 | 5 | 2 | 4 | -- | -- | -- |
| Hard maple | 36 | 30 | -- | -- | 6 | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 60 | -- | -- | 16 | 19 | 7 | 7 | 3 | 2 | -- | 5 | 1 | -- |
| Ash | 668 | 164 | 196 | 115 | 48 | 55 | 47 | 18 | 11 | 2 | 12 | -- | -- |
| Cottonwood | 268 | -- | 60 | 41 | 107 | 9 | 23 | 5 | 7 | 6 | 4 | 4 | 2 |
| Basswood | 49 | -- | -- | 17 | 17 | 3 | 5 | -- | 4 | -- | 2 | 1 | -- |
| Elm | 1,859 | 957 | 481 | 208 | 90 | 46 | 33 | 16 | 9 | 3 | 13 | 3 | -- |
| Black walnut | 860 | 318 | 163 | 161 | 108 | 59 | 28 | 7 | 9 | 5 | 2 | -- | -- |
| Willow | 91 | 27 | -- | 27 | 15 | 10 | 4 | 4 | 4 | -- | -- | -- | -- |
| Boxelder | 523 | 175 | 120 | 97 | 28 | 28 | 40 | 30 | 5 | -- | -- | -- | -- |
| Hackberry | 1,354 | 464 | 376 | 148 | 169 | 107 | 41 | 23 | 11 | 7 | 6 | 2 | -- |
| Sycamore | 56 | -- | 46 | -- | 7 | -- | 3 | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 2,085 | 1,081 | 565 | 191 | 96 | 79 | 35 | 13 | 9 | 8 | 6 | 1 | 1 |
| Total | 10,959 | 4,408 | 2,707 | 1,474 | 1,045 | 532 | 353 | 166 | 92 | 59 | 93 | 25 | 5 |
| All species | 11,099 | 4,475 | 2,760 | 1,481 | 1,045 | 541 | 357 | 166 | 92 | 59 | 93 | 25 | 5 |

Table 37.--Net volume of growing stock and sawtimber on commercial forest land by species group, Kansas, 1965 and 1981

| Species group | Growing stock | | Sawtimber | |
|---|---|---|---|---|
| | 1965[1] | 1981 | 1965[1] | 1981 |
| | Thousand cubic feet | | Thousand board feet[2] | |
| SOFTWOODS | | | | |
| Eastern redcedar | 216 | 4,591 | 511 | 10,871 |
| Total | 216 | 4,591 | 511 | 10,871 |
| HARDWOODS | | | | |
| Bur oak | 36,925 | 60,920 | 173,124 | 286,120 |
| Select white oak | 11,501 | 34,121 | 36,194 | 107,383 |
| Other white oak | 10,484 | 19,854 | 19,229 | 36,531 |
| Select red oak | 26,020 | 45,828 | 103,966 | 183,457 |
| Other red oak | 19,438 | 27,445 | 84,208 | 118,665 |
| Hickory | 13,103 | 29,081 | 30,502 | 67,696 |
| Pecan | 8,040 | 8,986 | 36,974 | 28,043 |
| Hard maple | 2,259 | 3,120 | 5,563 | 6,280 |
| Soft maple | 9,005 | 21,011 | 37,644 | 37,834 |
| Ash | 35,714 | 61,700 | 107,524 | 185,760 |
| Cottonwood | 101,052 | 134,292 | 459,058 | 610,060 |
| Basswood | 3,614 | 6,031 | 15,438 | 25,763 |
| Elm | 89,243 | 30,599 | 358,279 | 69,531 |
| Black walnut | 36,751 | 57,868 | 107,950 | 169,979 |
| Willow | 10,772 | 11,629 | 44,370 | 47,901 |
| Hackberry | 48,909 | 86,674 | 169,049 | 299,581 |
| Sycamore | 24,613 | 21,538 | 125,288 | 105,631 |
| Other hardwoods | 14,941 | 46,027 | 38,675 | 119,143 |
| Total | 502,384 | 706,724 | 1,953,035 | 2,555,358 |
| All species | 502,600 | 711,315 | 1,953,546 | 2,566,229 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1981 areas because of changes in survey definitions and procedures.

[2] International 1/4-inch rule.

Table 38.--Net volume of all live trees on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| Eastern redcedar | 5,560 | 1,757 | 1,507 | 555 | 880 | 495 | 165 | 65 | 136 | -- | -- | -- | -- |
| Total | 5,560 | 1,757 | 1,507 | 555 | 880 | 495 | 165 | 65 | 136 | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Bur oak | 74,323 | 2,702 | 2,776 | 3,714 | 3,441 | 4,121 | 6,020 | 7,350 | 7,189 | 8,217 | 17,306 | 9,659 | 1,828 |
| Select white oak | 51,342 | 6,172 | 8,006 | 9,441 | 7,059 | 4,882 | 4,516 | 3,154 | 2,573 | 1,664 | 3,060 | 690 | 125 |
| Other white oak | 23,758 | 5,753 | 5,035 | 4,691 | 2,447 | 2,530 | 1,537 | 1,112 | 170 | 231 | 252 | -- | -- |
| Select red oak | 50,853 | 2,237 | 4,375 | 5,853 | 7,090 | 4,566 | 5,710 | 4,465 | 4,779 | 2,314 | 6,201 | 2,729 | 534 |
| Other red oak | 32,530 | 2,042 | 3,197 | 3,148 | 3,594 | 3,053 | 2,703 | 2,819 | 2,814 | 2,710 | 4,309 | 1,797 | 344 |
| Select hickory | 19,345 | 3,617 | 3,753 | 3,022 | 2,133 | 2,721 | 1,484 | 1,634 | 533 | 190 | 258 | -- | -- |
| Other hickory | 13,245 | 2,768 | 3,038 | 3,057 | 1,837 | 1,211 | 312 | 373 | 348 | 175 | 126 | -- | -- |
| Pecan | 10,586 | 676 | 1,036 | 1,963 | 1,597 | 1,187 | 1,071 | 667 | 565 | 884 | 456 | 484 | -- |
| Hard maple | 3,389 | 533 | 1,033 | 563 | 549 | 279 | 49 | 43 | 99 | 113 | -- | 128 | -- |
| Soft maple | 24,380 | 657 | 1,527 | 1,621 | 1,531 | 2,746 | 2,478 | 2,445 | 2,104 | 1,815 | 3,780 | 2,084 | 1,592 |
| Ash | 74,481 | 8,696 | 12,292 | 10,909 | 7,291 | 8,434 | 6,452 | 6,441 | 3,937 | 2,686 | 6,802 | 541 | -- |
| Cottonwood | 145,155 | 2,707 | 4,588 | 9,618 | 11,409 | 13,089 | 11,941 | 9,544 | 11,156 | 6,362 | 25,242 | 21,936 | 17,563 |
| Basswood | 7,565 | 466 | 641 | 929 | 1,328 | 1,224 | 945 | 658 | 439 | 510 | 247 | 63 | 115 |
| Elm | 52,613 | 12,449 | 9,859 | 7,109 | 4,746 | 4,001 | 2,691 | 2,468 | 2,086 | 1,715 | 4,108 | 1,293 | 88 |
| Black walnut | 68,747 | 9,982 | 8,417 | 12,767 | 11,299 | 9,683 | 7,058 | 4,238 | 2,123 | 1,879 | 827 | 474 | -- |
| Willow | 15,402 | 783 | 1,190 | 1,472 | 2,520 | 2,611 | 1,898 | 1,792 | 1,485 | 634 | 893 | 4 | 120 |
| Boxelder | 22,328 | 3,635 | 3,634 | 3,200 | 3,341 | 2,261 | 2,078 | 1,970 | 622 | 652 | 590 | 304 | 41 |
| Hackberry | 104,831 | 10,607 | 12,300 | 13,297 | 13,423 | 12,380 | 12,255 | 9,010 | 6,749 | 4,775 | 6,389 | 3,646 | -- |
| Sycamore | 22,924 | 272 | 836 | 813 | 1,226 | 1,219 | 2,592 | 1,746 | 1,644 | 2,268 | 4,017 | 4,414 | 1,877 |
| Other hardwoods | 65,918 | 11,230 | 11,632 | 8,701 | 8,459 | 6,725 | 5,846 | 4,536 | 2,857 | 2,037 | 2,452 | 1,314 | 129 |
| Noncommercial species | 33,298 | 9,641 | 7,383 | 4,870 | 4,022 | 2,059 | 1,979 | 1,039 | 767 | 516 | 866 | 156 | -- |
| Total | 917,013 | 97,625 | 106,548 | 110,758 | 100,342 | 90,982 | 81,615 | 67,504 | 55,039 | 42,347 | 88,181 | 51,716 | 24,356 |
| All species | 922,573 | 99,382 | 108,055 | 111,313 | 101,222 | 91,477 | 81,780 | 67,569 | 55,175 | 42,347 | 88,181 | 51,716 | 24,356 |

Table 39.--Net volume of timber on commercial forest land by class of timber and softwoods and hardwoods, Kansas, 1981

(In thousand cubic feet)

| Class of timber | All species | Softwoods | Hardwoods |
|---|---|---|---|
| LIVE TREES | | | |
| Growing-stock trees | | | |
| Sawtimber | | | |
| Saw log portion | 392,254 | 1,762 | 390,492 |
| Upper stem portion | 98,594 | 176 | 98,418 |
| Subtotal | 490,848 | 1,938 | 488,910 |
| Poletimber | 220,467 | 2,653 | 217,814 |
| Total growing stock | 711,315 | 4,591 | 706,724 |
| Cull trees | | | |
| Rough and rotten cull trees | | | |
| Sawtimber | 72,857 | 221 | 72,636 |
| Poletimber | 70,972 | 338 | 70,634 |
| Subtotal | 143,829 | 559 | 143,270 |
| Short-log trees | 67,429 | 410 | 67,019 |
| Total cull | 211,258 | 969 | 210,289 |
| TOTAL LIVE TREES | 922,573 | 5,560 | 917,013 |
| SALVABLE DEAD TREES | 4,448 | 68 | 4,380 |
| ALL CLASSES | 927,021 | 5,628 | 921,393 |

Table 40.--Net volume of growing stock, sawtimber, short-log, and rough and rotten trees on commercial forest land by individual species, Kansas, 1981

| Species | Total all live | Growing stock | Short-log cull | Rough and rotten cull | Sawtimber |
|---|---|---|---|---|---|
| | - - - - - - - - -Thousand cubic feet- | | | - - - - - - - - | Thousand board feet[1/] |
| Eastern redcedar | 5,560 | 4,591 | 410 | 559 | 10,871 |
| Bur oak | 74,323 | 60,920 | 6,634 | 6,769 | 286,120 |
| White oak | 2,988 | 2,663 | 243 | 82 | 10,136 |
| Chinkapin oak | 48,354 | 31,458 | 4,632 | 12,264 | 97,247 |
| Post oak | 23,758 | 19,854 | 1,787 | 2,117 | 36,531 |
| Northern red oak | 50,034 | 45,152 | 1,723 | 3,159 | 180,754 |
| Shumard oak | 819 | 676 | 32 | 111 | 2,703 |
| Black oak | 21,214 | 18,536 | 977 | 1,701 | 80,893 |
| Blackjack oak | 4,519 | 2,400 | 1,077 | 1,042 | 3,827 |
| Pin oak | 6,474 | 6,186 | 43 | 245 | 33,378 |
| Shingle oak | 323 | 323 | -- | -- | 567 |
| Shellbark hickory | 1,667 | 1,481 | 90 | 96 | 2,936 |
| Mockernut hickory | 1,752 | 1,401 | 155 | 196 | 5,741 |
| Shagbark hickory | 15,926 | 14,506 | 683 | 737 | 34,370 |
| Bitternut hickory | 12,740 | 11,270 | 883 | 587 | 23,281 |
| Black hickory | 505 | 423 | 51 | 31 | 1,368 |
| Pecan | 10,586 | 8,986 | 757 | 843 | 28,043 |
| Sugar maple | 3,389 | 3,120 | 125 | 144 | 6,280 |
| Silver maple | 24,380 | 21,011 | 1,078 | 2,291 | 87,834 |
| White ash | 2,080 | 1,641 | 188 | 251 | 4,191 |
| Green ash | 72,401 | 60,059 | 5,258 | 7,084 | 181,569 |
| Eastern cottonwood | 145,155 | 134,292 | 4,011 | 6,852 | 610,060 |
| American basswood | 7,565 | 6,031 | 734 | 800 | 25,763 |
| American elm | 41,985 | 25,366 | 5,690 | 10,929 | 59,400 |
| Siberian elm | 1,041 | 343 | 264 | 434 | 271 |
| Slippery elm | 9,587 | 4,890 | 2,056 | 2,641 | 9,860 |
| Black walnut | 68,747 | 57,868 | 5,495 | 5,384 | 169,979 |
| Black willow | 15,402 | 11,629 | 821 | 2,952 | 47,901 |
| Boxelder | 22,328 | 10,376 | 3,487 | 8,465 | 22,839 |
| Hackberry | 104,831 | 86,674 | 9,118 | 9,039 | 299,581 |
| American sycamore | 22,924 | 21,538 | 250 | 1,136 | 105,631 |
| Black cherry | 1,936 | 1,250 | 366 | 320 | 3,455 |
| Black locust | 4,357 | 2,636 | 627 | 1,094 | 5,293 |
| Honeylocust | 27,648 | 16,555 | 3,739 | 7,354 | 49,897 |
| Kentucky coffeetree | 6,771 | 5,389 | 424 | 958 | 19,474 |
| Northern catalpa | 3,092 | 1,107 | 358 | 1,627 | 2,151 |
| Common persimmon | 1,347 | 1,113 | 24 | 210 | 612 |
| Red mulberry | 19,463 | 6,448 | 3,119 | 9,896 | 11,575 |
| River birch | 818 | 781 | -- | 37 | 2,278 |
| Sugarberry | 399 | 344 | -- | 55 | 1,569 |
| Texas buckeye | 87 | 28 | 20 | 39 | -- |
| All species[2/] | 889,275 | 711,315 | 67,429 | 110,531 | 2,566,229 |

[1/] International 1/4-inch rule.

[2/] These totals do not include volume for noncommercial species. Volumes for individual noncommercial species are found in Table 41.

Table 41.--Net volume of noncommercial species (nongrowing-stock volume) on commercial forest land by individual species, Kansas, 1981

(In thousand cubic feet)

| Species | Nongrowing-stock (rough tree) volume |
|---|---|
| Ailanthus | 136 |
| Eastern redbud | 1,329 |
| Hawthorn | 63 |
| Osage orange | 30,970 |
| Eastern hophornbeam | 800 |
| All species | 33,298 |

Table 42.--Net volume of growing stock on commercial forest land, by species group and Forest Survey Unit, Kansas, 1981

(In thousand cubic feet)

| Species group | All Units | Forest Survey Unit: North-eastern Unit | South-eastern Unit | Western Unit |
|---|---|---|---|---|
| SOFTWOODS | | | | |
| Eastern redcedar | 4,591 | 2,446 | 2,112 | 33 |
| Total | 4,591 | 2,446 | 2,112 | 33 |
| HARDWOODS | | | | |
| Bur oak | 60,920 | 29,902 | 15,644 | 15,374 |
| Select white oak | 34,121 | 22,050 | 12,071 | -- |
| Other white oak | 19,854 | 2,107 | 17,747 | -- |
| Select red oak | 45,828 | 25,577 | 20,251 | -- |
| Other red oak | 27,445 | 15,385 | 12,060 | -- |
| Select hickory | 17,388 | 11,801 | 5,587 | -- |
| Other hickory | 11,693 | 6,665 | 5,028 | -- |
| Pecan | 8,986 | 265 | 8,578 | 143 |
| Hard maple | 3,120 | 1,938 | 1,182 | -- |
| Soft maple | 21,011 | 10,459 | 10,552 | -- |
| Ash | 61,700 | 13,845 | 26,734 | 21,121 |
| Cottonwood | 134,292 | 43,561 | 9,786 | 80,945 |
| Basswood | 6,031 | 5,618 | 413 | -- |
| Elm | 30,599 | 13,932 | 12,589 | 4,078 |
| Black walnut | 57,868 | 32,366 | 23,004 | 2,498 |
| Willow | 11,629 | 5,021 | 4,204 | 2,404 |
| Boxelder | 10,376 | 3,563 | 1,831 | 4,982 |
| Hackberry | 86,674 | 37,640 | 38,441 | 10,593 |
| Sycamore | 21,538 | 11,447 | 9,787 | 304 |
| Other hardwoods | 35,651 | 19,505 | 11,527 | 4,619 |
| Total | 706,724 | 312,647 | 247,016 | 147,061 |
| All species | 711,315 | 315,093 | 249,128 | 147,094 |

Table 43.--Net volume of sawtimber on commercial forest land, by species group and Forest Survey Unit, Kansas, 1981

(In thousand board feet)[1]

| Species group | All Units | North-eastern Unit | South-eastern Unit | Western Unit |
|---|---|---|---|---|
| | | Forest Survey Unit | | |
| SOFTWOODS | | | | |
| Eastern redcedar | 10,871 | 5,106 | 5,765 | -- |
| Total | 10,871 | 5,106 | 5,765 | -- |
| HARDWOODS | | | | |
| Bur oak | 286,120 | 124,290 | 72,739 | 89,091 |
| Select white oak | 107,383 | 77,476 | 29,907 | -- |
| Other white oak | 36,531 | 6,145 | 30,386 | -- |
| Select red oak | 183,457 | 104,284 | 79,173 | -- |
| Other red oak | 118,665 | 70,133 | 48,532 | -- |
| Select hickory | 43,047 | 24,060 | 18,987 | -- |
| Other hickory | 24,649 | 14,453 | 10,196 | -- |
| Pecan | 28,043 | 575 | 26,708 | 760 |
| Hard maple | 6,280 | 3,635 | 2,645 | -- |
| Soft maple | 87,834 | 44,464 | 43,370 | -- |
| Ash | 185,760 | 42,154 | 87,049 | 56,557 |
| Cottonwood | 610,060 | 196,103 | 39,358 | 374,599 |
| Basswood | 25,763 | 24,807 | 956 | -- |
| Elm | 69,531 | 25,507 | 29,537 | 14,487 |
| Black walnut | 169,979 | 96,526 | 65,992 | 7,461 |
| Willow | 47,901 | 19,065 | 16,467 | 12,369 |
| Boxelder | 22,839 | 5,924 | 6,077 | 10,838 |
| Hackberry | 299,581 | 112,814 | 137,513 | 49,254 |
| Sycamore | 105,631 | 56,268 | 47,653 | 1,710 |
| Other hardwoods | 96,304 | 53,824 | 29,536 | 12,944 |
| Total | 2,555,358 | 1,102,507 | 822,781 | 630,070 |
| All species | 2,566,229 | 1,107,613 | 828,546 | 630,070 |

---

[1] International 1/4-inch rule.

(In thousand cubic feet)

NORTHEASTERN UNIT

| County | All species | Species group | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
| Atchison | 15,257 | 154 | 1,511 | 1,319 | 125 | 1,558 | 670 | 459 | 305 | -- | 235 | 366 | 740 |
| Brown | 10,457 | 132 | 985 | 1,194 | 118 | 1,372 | 558 | 421 | 266 | -- | 223 | 173 | 517 |
| Clay | 10,580 | 49 | 1,053 | 471 | 24 | 562 | 221 | 182 | 144 | -- | 31 | 395 | 527 |
| Dickinson | 9,597 | 54 | 867 | 423 | 23 | 722 | 223 | 179 | 134 | -- | 51 | 292 | 430 |
| Doniphan | 14,275 | 148 | 1,477 | 1,110 | 99 | 1,607 | 598 | 526 | 266 | -- | 178 | 446 | 640 |
| Douglas | 12,833 | 163 | 840 | 850 | 163 | 1,059 | 1,327 | 1,049 | 498 | -- | 18 | 310 | 287 |
| Franklin | 11,661 | 121 | 996 | 789 | 116 | 935 | 917 | 772 | 377 | 86 | 14 | 391 | 395 |
| Geary | 10,510 | 52 | 1,074 | 724 | 55 | 595 | 475 | 375 | 248 | -- | 7 | 352 | 438 |
| Jackson | 12,804 | 76 | 1,314 | 707 | 46 | 883 | 194 | 316 | 150 | -- | 5 | 791 | 839 |
| Jefferson | 21,868 | 170 | 1,607 | 1,437 | 215 | 1,615 | 2,061 | 1,391 | 713 | -- | 12 | 552 | 637 |
| Johnson | 14,091 | 135 | 1,458 | 1,204 | 156 | 1,395 | 553 | 419 | 222 | -- | 188 | 453 | 665 |
| Leavenworth | 28,197 | 92 | 2,572 | 1,689 | 145 | 1,789 | 2,187 | 1,038 | 642 | 75 | 2 | 872 | 1,076 |
| Marshall | 13,713 | 108 | 1,391 | 837 | 44 | 1,031 | 331 | 373 | 192 | -- | 84 | 553 | 619 |
| Miami | 25,539 | 242 | 2,645 | 2,281 | 180 | 2,563 | 964 | 776 | 458 | 64 | 379 | 844 | 1,324 |
| Nemaha | 6,733 | 35 | 643 | 374 | 27 | 450 | 105 | 175 | 83 | -- | -- | 362 | 451 |
| Osage | 17,114 | 125 | 1,615 | 1,229 | 109 | 1,290 | 794 | 652 | 379 | -- | 74 | 483 | 677 |
| Pottawatomie | 22,350 | 190 | 2,040 | 1,496 | 149 | 1,630 | 1,141 | 911 | 492 | -- | 115 | 640 | 859 |
| Riley | 16,697 | 161 | 1,648 | 1,133 | 97 | 1,386 | 713 | 653 | 357 | -- | 106 | 483 | 666 |
| Shawnee | 13,618 | 98 | 1,346 | 971 | 56 | 1,142 | 362 | 382 | 254 | -- | 115 | 481 | 712 |
| Wabaunsee | 17,097 | 78 | 1,734 | 1,030 | 70 | 939 | 597 | 454 | 316 | -- | 30 | 642 | 811 |
| Washington | 5,949 | 29 | 715 | 375 | 18 | 402 | 134 | 134 | 94 | -- | -- | 453 | 370 |
| Wyandotte | 4,153 | 34 | 371 | 407 | 72 | 652 | 260 | 164 | 75 | 40 | 71 | 125 | 165 |
| All counties | 315,093 | 2,446 | 29,902 | 22,050 | 2,107 | 25,577 | 15,385 | 11,801 | 6,665 | 265 | 1,938 | 10,459 | 13,845 |

SOUTHEASTERN UNIT

| County | All species | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allen | 5,884 | 36 | 528 | 119 | 111 | 276 | 150 | 86 | 105 | 180 | 6 | 351 | 709 |
| Anderson | 7,855 | 76 | 597 | 262 | 392 | 519 | 274 | 157 | 130 | 283 | 21 | 376 | 829 |
| Bourbon | 22,505 | 165 | 1,078 | 1,834 | 2,518 | 2,665 | 1,635 | 741 | 624 | 386 | 212 | 572 | 1,776 |
| Butler | 13,210 | 56 | 777 | 269 | 141 | 584 | 350 | 207 | 180 | 676 | 5 | 863 | 2,132 |
| Chase | 6,451 | 33 | 667 | 110 | 53 | 252 | 141 | 82 | 133 | 151 | 5 | 425 | 765 |
| Chautauqua | 23,805 | 248 | 1,088 | 1,173 | 3,450 | 2,173 | 1,439 | 548 | 456 | 1,140 | 56 | 805 | 2,432 |
| Cherokee | 10,615 | 113 | 511 | 437 | 1,033 | 743 | 595 | 170 | 173 | 662 | 30 | 399 | 1,289 |
| Coffey | 4,132 | 66 | 218 | 198 | 390 | 277 | 248 | 75 | 65 | 241 | 19 | 112 | 369 |
| Cowley | 17,562 | 67 | 1,148 | 427 | 330 | 954 | 406 | 435 | 272 | 502 | 13 | 1,150 | 2,392 |
| Crawford | 13,088 | 110 | 1,047 | 516 | 539 | 1,018 | 388 | 217 | 220 | 393 | 56 | 630 | 1,490 |
| Elk | 14,054 | 131 | 645 | 634 | 1,332 | 1,278 | 731 | 325 | 257 | 651 | 45 | 561 | 1,622 |
| Greenwood | 13,017 | 102 | 1,240 | 265 | 341 | 541 | 352 | 153 | 223 | 412 | 13 | 651 | 1,382 |
| Labette | 7,380 | 98 | 364 | 363 | 803 | 535 | 450 | 141 | 123 | 448 | 31 | 245 | 804 |
| Linn | 30,993 | 308 | 2,022 | 2,369 | 1,882 | 3,385 | 1,946 | 779 | 860 | 645 | 355 | 1,027 | 2,713 |
| Lyon | 8,015 | 24 | 699 | 210 | 103 | 405 | 183 | 204 | 143 | 109 | 11 | 507 | 964 |
| Marion | 4,533 | 23 | 238 | 126 | 158 | 292 | 124 | 111 | 62 | 213 | 3 | 269 | 660 |
| Montgomery | 13,509 | 176 | 959 | 932 | 363 | 1,289 | 710 | 361 | 290 | 319 | 136 | 487 | 1,196 |
| Morris | 4,669 | 29 | 405 | 143 | 117 | 284 | 92 | 108 | 78 | 81 | 12 | 276 | 531 |
| Neosho | 6,724 | 70 | 327 | 302 | 755 | 491 | 393 | 123 | 117 | 387 | 13 | 233 | 750 |
| Wilson | 15,578 | 103 | 801 | 1,111 | 1,849 | 1,698 | 1,106 | 462 | 419 | 374 | 113 | 449 | 1,394 |
| Woodson | 5,549 | 78 | 285 | 266 | 587 | 392 | 337 | 102 | 93 | 320 | 22 | 164 | 535 |
| All counties | 249,128 | 2,112 | 15,644 | 12,071 | 17,747 | 20,251 | 12,060 | 5,587 | 5,028 | 8,579 | 1,182 | 10,552 | 26,734 |

(Table 44 continued on next page)

(Table 44 continued)

NORTHEASTERN UNIT

| County | Species group | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cotton-wood | Bass-wood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
| Atchison | 1,792 | 299 | 529 | 1,430 | 151 | 133 | 2,112 | 614 | 755 |
| Brown | 517 | 168 | 345 | 1,075 | 90 | 130 | 1,177 | 420 | 576 |
| Clay | 2,301 | 219 | 381 | 956 | 175 | 100 | 1,745 | 481 | 563 |
| Dickinson | 2,061 | 211 | 348 | 864 | 194 | 95 | 1,509 | 473 | 444 |
| Doniphan | 1,307 | 344 | 533 | 1,568 | 222 | 165 | 1,740 | 446 | 855 |
| Douglas | 967 | 206 | 809 | 1,430 | 318 | 128 | 1,111 | 444 | 856 |
| Franklin | 1,016 | 180 | 626 | 1,383 | 159 | 132 | 1,091 | 319 | 846 |
| Geary | 1,790 | 170 | 447 | 1,164 | 115 | 69 | 1,333 | 363 | 664 |
| Jackson | 2,022 | 132 | 637 | 1,298 | 205 | 334 | 1,447 | 133 | 1,275 |
| Jefferson | 2,910 | 295 | 1,238 | 2,453 | 332 | 164 | 1,788 | 900 | 1,378 |
| Johnson | 1,326 | 341 | 545 | 1,418 | 175 | 173 | 1,924 | 584 | 757 |
| Leavenworth | 6,126 | 326 | 1,468 | 2,924 | 169 | 127 | 1,994 | 1,232 | 1,652 |
| Marshall | 2,060 | 300 | 650 | 1,335 | 396 | 221 | 1,812 | 485 | 891 |
| Miami | 2,347 | 560 | 963 | 2,517 | 252 | 318 | 3,476 | 972 | 1,414 |
| Nemaha | 1,123 | 69 | 310 | 708 | 97 | 195 | 774 | 60 | 692 |
| Osage | 2,446 | 268 | 737 | 1,780 | 423 | 181 | 2,158 | 712 | 982 |
| Pottawatomie | 2,993 | 440 | 941 | 2,167 | 673 | 262 | 3,085 | 881 | 1,245 |
| Riley | 2,292 | 344 | 699 | 1,693 | 287 | 187 | 2,149 | 615 | 1,028 |
| Shawnee | 1,896 | 284 | 517 | 1,357 | 260 | 179 | 1,862 | 458 | 886 |
| Wabaunsee | 3,296 | 273 | 751 | 1,725 | 231 | 157 | 2,274 | 621 | 1,068 |
| Washington | 871 | 49 | 318 | 629 | 62 | 88 | 619 | 95 | 494 |
| Wyandotte | 102 | 140 | 140 | 492 | 35 | 25 | 460 | 139 | 184 |
| All counties | 43,561 | 5,618 | 13,932 | 32,366 | 5,021 | 3,563 | 37,640 | 11,447 | 19,505 |

SOUTHEASTERN UNIT

| County | Cotton-wood | Bass-wood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
|---|---|---|---|---|---|---|---|---|---|
| Allen | 347 | 4 | 263 | 530 | 134 | 54 | 1,334 | 259 | 302 |
| Anderson | 392 | 8 | 394 | 731 | 148 | 65 | 1,491 | 302 | 408 |
| Bourbon | 440 | 59 | 1,089 | 2,022 | 129 | 165 | 2,682 | 794 | 919 |
| Butler | 701 | 7 | 775 | 1,197 | 401 | 107 | 2,297 | 709 | 676 |
| Chase | 377 | 3 | 233 | 527 | 142 | 56 | 1,659 | 296 | 341 |
| Chautauqua | 563 | 64 | 1,358 | 2,240 | 359 | 104 | 2,221 | 774 | 1,114 |
| Cherokee | 540 | 25 | 648 | 1,115 | 265 | 42 | 1,033 | 348 | 444 |
| Coffey | 264 | 12 | 252 | 492 | 93 | 20 | 445 | 103 | 173 |
| Cowley | 617 | 8 | 973 | 1,517 | 379 | 219 | 3,797 | 992 | 964 |
| Crawford | 689 | 9 | 606 | 1,178 | 254 | 111 | 2,490 | 541 | 581 |
| Elk | 490 | 25 | 817 | 1,308 | 254 | 82 | 1,611 | 529 | 726 |
| Greenwood | 1,005 | 12 | 605 | 1,231 | 299 | 125 | 2,847 | 469 | 639 |
| Labette | 315 | 19 | 435 | 801 | 160 | 27 | 696 | 223 | 299 |
| Linn | 1,109 | 54 | 1,221 | 2,723 | 320 | 156 | 4,720 | 1,101 | 1,298 |
| Lyon | 289 | 4 | 370 | 658 | 135 | 122 | 1,998 | 441 | 431 |
| Marion | 177 | 3 | 278 | 397 | 112 | 44 | 758 | 236 | 249 |
| Montgomery | 349 | 19 | 571 | 1,244 | 141 | 114 | 2,250 | 532 | 571 |
| Morris | 183 | 2 | 208 | 396 | 80 | 60 | 1,107 | 238 | 234 |
| Neosho | 313 | 18 | 404 | 710 | 149 | 28 | 652 | 209 | 275 |
| Wilson | 322 | 42 | 753 | 1,368 | 130 | 105 | 1,784 | 541 | 654 |
| Woodson | 304 | 16 | 336 | 619 | 120 | 25 | 569 | 150 | 229 |
| All counties | 9,786 | 413 | 12,589 | 23,004 | 4,204 | 1,831 | 38,441 | 9,787 | 11,527 |

(Table 44 continued on next page)

(Table 44 continued)

WESTERN UNIT

| County | Species group |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  | Cotton-wood | Bass-wood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
| Barber | 3,560 | -- | 134 | 73 | 99 | 186 | 400 | 5 | 151 |
| Barton | 360 | -- | 25 | 18 | 24 | 42 | 92 | -- | 28 |
| Cheyenne | 1,072 | -- | 66 | 37 | 44 | 92 | 206 | 3 | 64 |
| Clark | 2,782 | -- | 49 | 35 | 39 | 92 | 223 | -- | 57 |
| Cloud | 4,360 | -- | 273 | 180 | 132 | 257 | 676 | 20 | 275 |
| Comanche | 259 | -- | 15 | 10 | 11 | 37 | 49 | -- | 16 |
| Decatur | 684 | -- | 51 | 30 | 41 | 71 | 164 | 1 | 54 |
| Edwards | 1,228 | -- | 63 | 11 | 17 | 29 | 61 | -- | 23 |
| Ellis | 878 | -- | 60 | 43 | 54 | 90 | 196 | 1 | 73 |
| Ellsworth | 1,157 | -- | 77 | 52 | 45 | 97 | 252 | 8 | 92 |
| Finney | 84 | -- | 5 | -- | 3 | 7 | 18 | -- | 3 |
| Ford | 146 | -- | 12 | 7 | 8 | 27 | 24 | -- | 12 |
| Gove | 58 | -- | 3 | 4 | 3 | 6 | 14 | -- | 4 |
| Graham | 1,723 | -- | 111 | 63 | 74 | 148 | 318 | 7 | 122 |
| Grant | 46 | -- | -- | 3 | -- | 7 | -- | -- | 2 |
| Gray | 1,008 | -- | 8 | -- | 5 | 11 | 26 | -- | 4 |
| Greeley | 20 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hamilton | 700 | -- | 43 | 10 | 32 | 72 | 161 | -- | 34 |
| Harper | 2,040 | -- | 96 | 80 | 73 | 143 | 248 | 8 | 141 |
| Harvey | 516 | -- | 40 | 7 | 24 | 54 | 76 | -- | 29 |
| Haskell | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hodgeman | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jewell | 3,377 | -- | 156 | 70 | 124 | 221 | 536 | 1 | 155 |
| Kearny | 226 | -- | -- | -- | -- | -- | 20 | -- | -- |
| Kingman | 3,691 | -- | 168 | 158 | 108 | 224 | 329 | 20 | 270 |
| Kiowa | 135 | -- | 5 | -- | 3 | 5 | 19 | -- | 3 |
| Lane | 15 | -- | 2 | -- | 2 | 2 | 5 | -- | 1 |
| Lincoln | 1,273 | -- | 72 | 55 | 51 | 111 | 218 | 3 | 81 |
| Logan | 263 | -- | 21 | 12 | 15 | 26 | 56 | 1 | 25 |
| McPherson | 2,068 | -- | 94 | 61 | 54 | 111 | 243 | 4 | 91 |
| Meade | 752 | -- | 27 | 18 | 20 | 40 | 101 | -- | 26 |
| Mitchell | 2,785 | -- | 157 | 136 | 85 | 233 | 403 | 24 | 243 |
| Morton | 647 | -- | 40 | 14 | 32 | 52 | 115 | -- | 37 |
| Ness | 126 | -- | 13 | 7 | 3 | 10 | 33 | 3 | 16 |
| Norton | 786 | -- | 72 | 27 | 48 | 90 | 179 | 3 | 68 |
| Osborne | 2,810 | -- | 155 | 87 | 91 | 183 | 436 | 16 | 185 |
| Ottawa | 2,565 | -- | 154 | 131 | 99 | 195 | 427 | 24 | 247 |
| Pawnee | 774 | -- | 28 | 13 | 20 | 47 | 93 | -- | 27 |
| Phillips | 2,168 | -- | 111 | 95 | 100 | 203 | 307 | 3 | 154 |
| Pratt | 1,075 | -- | 39 | 18 | 21 | 38 | 86 | -- | 28 |
| Rawlins | 637 | -- | 49 | 31 | 37 | 66 | 159 | 3 | 56 |
| Reno | 2,960 | -- | 137 | 121 | 89 | 191 | 290 | 17 | 220 |
| Republic | 3,743 | -- | 166 | 60 | 106 | 180 | 440 | 1 | 132 |
| Rice | 1,363 | -- | 39 | 14 | 10 | 28 | 57 | 3 | 30 |
| Rooks | 3,250 | -- | 136 | 78 | 82 | 183 | 363 | 12 | 165 |
| Rush | 30 | -- | 5 | -- | 3 | 5 | 9 | -- | 3 |
| Russell | 1,990 | -- | 115 | 67 | 67 | 124 | 319 | 7 | 112 |

(Table 44 continued on next page)

(Table 44 continued)

WESTERN UNIT

| County | Species group | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cotton-wood | Bass-wood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
| Saline | 1,152 | -- | 87 | 60 | 46 | 105 | 237 | 8 | 99 |
| Scott | 33 | -- | 5 | 2 | -- | 2 | 10 | 1 | 6 |
| Sedgwick | 2,615 | -- | 166 | 140 | 86 | 206 | 396 | 31 | 271 |
| Seward | 850 | -- | 36 | 34 | 37 | 66 | 131 | -- | 49 |
| Sheridan | 564 | -- | 25 | 19 | 21 | 35 | 79 | 1 | 33 |
| Sherman | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Smith | 1,187 | -- | 79 | 39 | 66 | 112 | 250 | -- | 77 |
| Stafford | 3,371 | -- | 59 | 21 | 21 | 50 | 78 | -- | 40 |
| Stanton | 10 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stevens | 177 | -- | 16 | 7 | 13 | 21 | 47 | -- | 15 |
| Sumner | 7,845 | -- | 481 | 212 | 98 | 291 | 833 | 61 | 421 |
| Thomas | 458 | -- | 3 | 4 | 3 | 6 | 14 | -- | 6 |
| Trego | 456 | -- | 29 | 21 | 15 | 45 | 71 | 4 | 41 |
| Wallace | 37 | -- | -- | 3 | -- | 7 | -- | -- | 2 |
| Wichita | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All counties | 80,945 | -- | 4,078 | 2,498 | 2,404 | 4,982 | 10,593 | 304 | 4,619 |
| All units | 134,292 | 6,031 | 30,599 | 57,868 | 11,629 | 10,376 | 86,674 | 21,538 | 35,651 |

(Table 44 continued)

WESTERN UNIT

| County | All species | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Species group | | | | | | | | | | | |
| Barber | 5,798 | -- | 558 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 627 |
| Barton | 855 | -- | 114 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 150 |
| Cheyenne | 2,113 | -- | 262 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 263 |
| Clark | 4,229 | -- | 149 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | 800 |
| Cloud | 7,899 | -- | 1,037 | -- | -- | -- | -- | -- | -- | 13 | -- | -- | 676 |
| Comanche | 668 | -- | 51 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 220 |
| Decatur | 1,530 | -- | 223 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | 208 |
| Edwards | 1,617 | -- | 81 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 103 |
| Ellis | 1,928 | -- | 261 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 268 |
| Ellsworth | 2,442 | -- | 374 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 284 |
| Finney | 208 | -- | 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 74 |
| Ford | 381 | -- | 34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 111 |
| Gove | 120 | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 |
| Graham | 3,525 | -- | 459 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 495 |
| Grant | 85 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 27 |
| Gray | 1,218 | -- | 21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 135 |
| Greeley | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hamilton | 1,941 | 5 | 135 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 747 |
| Harper | 3,860 | -- | 352 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | 676 |
| Harvey | 1,095 | -- | 108 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 241 |
| Haskell | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hodgeman | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jewell | 6,180 | -- | 545 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 990 |
| Kearny | 253 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7 |
| Kingman | 6,627 | -- | 557 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | 1,099 |
| Kiowa | 216 | 6 | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 27 |
| Lane | 46 | -- | 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12 |
| Lincoln | 2,458 | -- | 295 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 305 |
| Logan | 609 | 6 | 85 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 98 |
| McPherson | 3,343 | -- | 327 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 285 |
| Meade | 1,351 | -- | 82 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 283 |
| Mitchell | 5,774 | -- | 718 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 986 |
| Morton | 1,330 | 5 | 124 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 263 |
| Ness | 323 | -- | 68 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 44 |
| Norton | 1,896 | -- | 266 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 355 |
| Osborne | 5,340 | -- | 714 | -- | -- | -- | -- | -- | -- | 6 | -- | -- | 657 |
| Ottawa | 5,508 | -- | 732 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 929 |
| Pawnee | 1,281 | -- | 93 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 185 |
| Phillips | 4,309 | -- | 399 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 764 |
| Pratt | 1,540 | -- | 103 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 130 |
| Rawlins | 1,464 | -- | 228 | -- | -- | -- | -- | -- | -- | 3 | -- | -- | 195 |
| Reno | 5,517 | -- | 512 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 978 |
| Republic | 6,082 | -- | 498 | -- | -- | -- | -- | -- | -- | 5 | -- | -- | 751 |
| Rice | 1,749 | -- | 99 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 105 |
| Rooks | 5,653 | -- | 553 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 827 |
| Rush | 91 | -- | 13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 23 |
| Russell | 3,598 | -- | 451 | -- | -- | -- | -- | -- | -- | 6 | -- | -- | 340 |

(Table 44 continued on next page)

(Table 44 continued)

WESTERN UNIT

| County | All species | Species group |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
| Saline | 2,507 | -- | 379 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 334 |
| Scott | 102 | -- | 26 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17 |
| Sedgwick | 5,687 | -- | 785 | -- | -- | -- | -- | -- | -- | 44 | -- | -- | 947 |
| Seward | 1,565 | -- | 138 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 224 |
| Sheridan | 997 | -- | 113 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 107 |
| Sherman | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Smith | 2,513 | -- | 315 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 388 |
| Stafford | 3,904 | 10 | 101 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 153 |
| Stanton | 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stevens | 425 | -- | 61 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 68 |
| Sumner | 13,787 | -- | 1,596 | -- | -- | -- | -- | -- | -- | 99 | -- | -- | 1,850 |
| Thomas | 522 | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 |
| Trego | 1,044 | -- | 121 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 241 |
| Wallace | 76 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 27 |
| Wichita | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All counties | 147,094 | 33 | 15,374 | -- | -- | -- | -- | -- | -- | 143 | -- | -- | 21,121 |
| All units | 711,315 | 4,591 | 60,920 | 34,121 | 19,854 | 45,828 | 27,445 | 17,388 | 11,693 | 8,986 | 3,120 | 21,011 | 61,700 |

(Table 44 continued on next page)

(In thousand board feet)[1]

NORTHEASTERN UNIT

| County | All species | Species group |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
| Atchisor | 54,573 | 366 | 6,083 | 4,934 | 246 | 6,233 | 2,964 | 1,196 | 864 | -- | 417 | 1,463 | 2,252 |
| Brown | 36,117 | 296 | 3,781 | 4,463 | 227 | 5,619 | 2,541 | 1,116 | 748 | -- | 381 | 759 | 1,636 |
| Clay | 39,325 | 118 | 4,730 | 1,806 | 64 | 2,107 | 907 | 489 | 343 | -- | 81 | 1,472 | 1,610 |
| Dickinson | 35,993 | 132 | 3,752 | 1,524 | 52 | 2,929 | 859 | 554 | 492 | -- | 114 | 1,087 | 1,242 |
| Doniphan | 49,986 | 295 | 6,220 | 3,694 | 251 | 6,603 | 2,704 | 1,382 | 1,029 | -- | 351 | 1,833 | 1,882 |
| Douglas | 42,640 | 268 | 3,111 | 2,890 | 629 | 5,120 | 6,583 | 1,467 | 667 | -- | -- | 1,455 | 515 |
| Franklin | 38,529 | 214 | 3,949 | 2,634 | 439 | 4,205 | 4,534 | 1,133 | 508 | 184 | -- | 1,817 | 1,076 |
| Geary | 36,690 | 108 | 4,473 | 2,523 | 177 | 2,373 | 2,238 | 687 | 428 | -- | 14 | 1,446 | 1,315 |
| Jackson | 43,704 | 185 | 5,918 | 1,928 | 229 | 2,659 | 956 | 405 | 82 | -- | 4 | 3,744 | 2,978 |
| Jefferson | 74,959 | 276 | 5,903 | 5,037 | 786 | 7,190 | 9,657 | 2,127 | 1,015 | -- | -- | 2,506 | 1,541 |
| Johnson | 49,515 | 290 | 6,286 | 4,305 | 329 | 5,781 | 2,376 | 1,227 | 735 | -- | 376 | 1,715 | 2,033 |
| Leavenworth | 102,048 | 172 | 9,657 | 6,143 | 418 | 7,288 | 9,004 | 1,838 | 1,027 | 161 | -- | 4,046 | 3,276 |
| Marshall | 48,596 | 205 | 6,316 | 2,969 | 128 | 4,300 | 1,532 | 955 | 503 | -- | 194 | 2,237 | 1,939 |
| Miami | 90,212 | 560 | 11,131 | 8,514 | 362 | 10,300 | 4,383 | 2,243 | 1,508 | 138 | 738 | 3,393 | 4,267 |
| Nemaha | 23,062 | 75 | 2,941 | 980 | 141 | 1,453 | 509 | 198 | 17 | -- | -- | 1,626 | 1,473 |
| Osage | 59,394 | 268 | 6,721 | 4,320 | 329 | 4,948 | 3,717 | 1,256 | 642 | -- | 112 | 2,018 | 2,002 |
| Pottawatomie | 78,642 | 399 | 8,642 | 5,317 | 481 | 6,792 | 5,365 | 1,686 | 971 | -- | 204 | 2,538 | 2,394 |
| Riley | 58,691 | 316 | 7,011 | 3,953 | 292 | 5,651 | 3,327 | 1,290 | 730 | -- | 180 | 1,940 | 1,856 |
| Shawnee | 48,657 | 209 | 5,842 | 3,476 | 130 | 4,536 | 1,612 | 1,095 | 926 | -- | 241 | 1,933 | 2,320 |
| Wabaunsee | 60,783 | 181 | 7,414 | 3,715 | 208 | 3,554 | 2,678 | 901 | 514 | -- | 66 | 2,649 | 2,565 |
| Washington | 20,775 | 95 | 3,039 | 1,239 | 60 | 1,740 | 626 | 236 | 114 | -- | -- | 2,285 | 1,535 |
| Wyandotte | 14,722 | 78 | 1,370 | 1,112 | 167 | 2,903 | 1,061 | 579 | 590 | 92 | 162 | 502 | 447 |
| All counties | 1,107,613 | 5,106 | 124,290 | 77,476 | 6,145 | 104,284 | 70,133 | 24,060 | 14,453 | 575 | 3,635 | 44,464 | 42,154 |
| SOUTHEASTERN UNIT |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Allen | 21,738 | 92 | 2,647 | 362 | 152 | 1,042 | 633 | 328 | 307 | 573 | 16 | 1,596 | 2,344 |
| Anderson | 27,000 | 249 | 2,391 | 752 | 514 | 2,036 | 1,000 | 575 | 343 | 896 | 55 | 1,640 | 2,647 |
| Bourbon | 71,539 | 396 | 4,404 | 4,255 | 4,524 | 10,508 | 7,495 | 2,413 | 937 | 1,433 | 440 | 1,998 | 5,348 |
| Butler | 46,894 | 105 | 4,001 | 758 | 294 | 2,578 | 1,380 | 895 | 384 | 1,648 | 11 | 3,518 | 7,694 |
| Chase | 24,968 | 63 | 3,390 | 345 | 122 | 911 | 711 | 265 | 419 | 504 | 11 | 2,034 | 2,512 |
| Chautauqua | 67,063 | 624 | 4,452 | 3,105 | 5,223 | 8,925 | 3,804 | 1,537 | 737 | 3,158 | 153 | 3,066 | 7,863 |
| Cherokee | 31,617 | 362 | 2,188 | 1,184 | 1,572 | 3,006 | 1,708 | 468 | 322 | 2,013 | 83 | 1,500 | 4,260 |
| Coffey | 12,314 | 226 | 901 | 556 | 627 | 1,114 | 768 | 202 | 153 | 896 | 52 | 388 | 1,080 |
| Cowley | 63,884 | 145 | 5,837 | 1,120 | 561 | 3,509 | 1,605 | 2,083 | 602 | 1,349 | 33 | 4,610 | 8,511 |
| Crawford | 46,381 | 279 | 5,111 | 1,182 | 961 | 3,925 | 1,734 | 753 | 597 | 1,234 | 115 | 2,797 | 4,666 |
| Elk | 43,253 | 309 | 2,379 | 1,669 | 2,117 | 5,170 | 2,539 | 1,066 | 400 | 1,562 | 104 | 2,154 | 5,507 |
| Greenwood | 46,996 | 251 | 6,025 | 886 | 418 | 2,550 | 1,526 | 471 | 703 | 1,501 | 34 | 2,976 | 4,171 |
| Labette | 21,649 | 341 | 1,531 | 976 | 1,234 | 2,145 | 1,282 | 398 | 235 | 1,455 | 88 | 920 | 2,606 |
| Linn | 108,858 | 872 | 9,424 | 5,203 | 4,319 | 12,957 | 10,506 | 2,409 | 1,684 | 2,443 | 741 | 4,601 | 8,340 |
| Lyon | 30,369 | 39 | 3,492 | 564 | 220 | 1,461 | 919 | 923 | 364 | 368 | 24 | 2,128 | 3,303 |
| Marion | 15,386 | 64 | 1,188 | 360 | 241 | 1,113 | 406 | 428 | 114 | 497 | 7 | 1,048 | 2,352 |
| Montgomery | 46,711 | 572 | 4,488 | 2,014 | 1,877 | 4,805 | 3,312 | 1,327 | 634 | 1,311 | 303 | 2,067 | 3,686 |
| Morris | 17,333 | 68 | 2,024 | 357 | 241 | 1,035 | 413 | 441 | 222 | 283 | 24 | 1,192 | 1,731 |
| Neosho | 19,572 | 223 | 1,361 | 330 | 1,129 | 1,999 | 1,102 | 317 | 217 | 1,211 | 52 | 368 | 2,412 |
| Wilson | 43,604 | 203 | 3,327 | 2,699 | 3,127 | 6,802 | 4,691 | 1,408 | 625 | 1,148 | 235 | 1,683 | 4,392 |
| Woodson | 16,317 | 266 | 1,178 | 730 | 913 | 1,582 | 998 | 280 | 197 | 1,125 | 63 | 586 | 1,624 |
| All counties | 828,546 | 5,765 | 72,739 | 29,907 | 30,386 | 79,173 | 48,532 | 18,987 | 10,196 | 26,708 | 2,645 | 43,370 | 87,049 |

(Table 45 continued on next page)

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[1] International 1/4-inch rule.

(Table 45 continued)

| County | Cotton-wood | Bass-wood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
|---|---|---|---|---|---|---|---|---|---|
| | Species group | | | | | | | | |
| NORTHEASTERN UNIT | | | | | | | | | |
| Atchison | 8,305 | 1,335 | 1,073 | 4,589 | 510 | 129 | 6,462 | 2,993 | 2,159 |
| Brown | 2,220 | 708 | 592 | 3,191 | 395 | 160 | 3,475 | 2,047 | 1,762 |
| Clay | 10,634 | 1,048 | 838 | 3,097 | 568 | 124 | 5,475 | 2,264 | 1,550 |
| Dickinson | 9,590 | 986 | 755 | 2,930 | 713 | 64 | 4,716 | 2,183 | 1,319 |
| Doniphan | 5,429 | 1,536 | 1,000 | 5,042 | 622 | 269 | 5,271 | 2,130 | 2,443 |
| Douglas | 4,079 | 850 | 1,519 | 3,784 | 1,535 | 177 | 3,242 | 2,333 | 2,416 |
| Franklin | 4,187 | 738 | 1,125 | 3,725 | 748 | 262 | 3,174 | 1,674 | 2,203 |
| Geary | 7,606 | 717 | 905 | 3,527 | 407 | 112 | 4,036 | 1,780 | 1,818 |
| Jackson | 9,697 | 662 | 940 | 3,475 | 904 | 900 | 4,132 | 730 | 3,176 |
| Jefferson | 13,421 | 1,140 | 2,174 | 6,745 | 1,530 | 269 | 5,049 | 4,673 | 3,920 |
| Johnson | 5,521 | 1,579 | 1,185 | 4,368 | 499 | 174 | 5,960 | 2,643 | 2,133 |
| Leavenworth | 29,964 | 1,152 | 2,003 | 8,475 | 612 | 258 | 5,490 | 6,509 | 4,555 |
| Marshall | 8,787 | 1,409 | 1,135 | 4,078 | 1,240 | 311 | 5,486 | 2,309 | 2,563 |
| Miami | 10,034 | 2,567 | 1,742 | 7,787 | 813 | 377 | 10,601 | 4,735 | 4,019 |
| Nemaha | 5,519 | 362 | 512 | 1,893 | 472 | 549 | 2,280 | 326 | 1,736 |
| Osage | 10,789 | 1,164 | 1,521 | 5,255 | 1,646 | 307 | 6,399 | 3,382 | 2,598 |
| Pottawatomie | 13,621 | 1,999 | 1,929 | 6,478 | 2,506 | 415 | 9,320 | 4,270 | 3,315 |
| Riley | 10,314 | 1,541 | 1,304 | 5,157 | 1,165 | 251 | 6,633 | 2,956 | 2,824 |
| Shawnee | 8,034 | 1,299 | 969 | 4,207 | 969 | 299 | 5,732 | 2,197 | 2,631 |
| Wabaunsee | 14,466 | 1,211 | 1,537 | 5,214 | 798 | 285 | 6,916 | 3,039 | 2,872 |
| Washington | 3,657 | 190 | 374 | 1,729 | 293 | 210 | 1,614 | 535 | 1,204 |
| Wyandotte | 229 | 614 | 375 | 1,780 | 120 | 22 | 1,351 | 560 | 608 |
| All counties | 196,103 | 24,807 | 25,507 | 96,526 | 19,065 | 5,924 | 112,814 | 56,268 | 53,824 |
| SOUTHEASTERN UNIT | | | | | | | | | |
| Allen | 1,341 | 2 | 671 | 1,702 | 488 | 154 | 5,200 | 1,362 | 726 |
| Anderson | 1,522 | 12 | 934 | 2,105 | 547 | 202 | 5,656 | 1,556 | 868 |
| Bourbon | 1,935 | 216 | 2,500 | 5,887 | 525 | 619 | 9,119 | 3,674 | 2,913 |
| Butler | 2,854 | 1 | 1,822 | 3,558 | 1,661 | 362 | 8,109 | 3,475 | 1,786 |
| Chase | 1,457 | 1 | 625 | 1,875 | 512 | 135 | 6,649 | 1,590 | 837 |
| Chautauqua | 2,431 | 36 | 2,892 | 5,139 | 1,560 | 348 | 6,307 | 3,451 | 2,252 |
| Cherokee | 2,096 | 15 | 1,453 | 2,755 | 1,028 | 137 | 3,009 | 1,512 | 946 |
| Coffey | 954 | 9 | 615 | 1,213 | 303 | 67 | 1,405 | 452 | 333 |
| Cowley | 2,551 | 8 | 2,628 | 4,781 | 1,581 | 778 | 13,720 | 5,130 | 2,741 |
| Crawford | 2,697 | 21 | 1,405 | 3,774 | 934 | 346 | 9,595 | 2,763 | 1,492 |
| Elk | 2,059 | 46 | 1,733 | 3,235 | 1,073 | 291 | 5,207 | 2,447 | 1,586 |
| Greenwood | 3,741 | 5 | 1,519 | 3,782 | 930 | 368 | 11,252 | 2,486 | 1,391 |
| Labette | 1,232 | 16 | 987 | 1,918 | 637 | 87 | 1,975 | 973 | 613 |
| Linn | 4,558 | 318 | 2,667 | 8,671 | 1,235 | 449 | 18,265 | 5,260 | 3,936 |
| Lyon | 1,187 | 12 | 1,070 | 2,231 | 531 | 427 | 7,488 | 2,360 | 1,258 |
| Marion | 736 | 1 | 662 | 1,158 | 472 | 161 | 2,591 | 1,166 | 621 |
| Montgomery | 1,484 | 90 | 1,411 | 3,793 | 590 | 393 | 8,224 | 2,683 | 1,647 |
| Morris | 729 | 1 | 579 | 1,346 | 302 | 201 | 4,215 | 1,271 | 658 |
| Neosho | 1,208 | 9 | 915 | 1,762 | 571 | 90 | 1,900 | 910 | 586 |
| Wilson | 1,461 | 126 | 1,654 | 3,807 | 566 | 379 | 5,903 | 2,474 | 1,888 |
| Woodson | 1,125 | 11 | 795 | 1,500 | 421 | 83 | 1,724 | 658 | 458 |
| All counties | 39,358 | 956 | 29,537 | 65,992 | 16,467 | 6,077 | 137,513 | 47,653 | 29,536 |

(Table 45 continued on next page)

(Table 45 continued)

WESTERN UNIT

| County | All species | Species group |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
| Barber | 24,452 | -- | 3,286 | -- | -- | -- | -- | -- | -- | 32 | -- | -- | 2,098 |
| Barton | 3,612 | -- | 682 | -- | -- | -- | -- | -- | -- | 10 | -- | -- | 384 |
| Cheyenne | 9,498 | -- | 1,546 | -- | -- | -- | -- | -- | -- | 19 | -- | -- | 926 |
| Clark | 16,084 | -- | 894 | -- | -- | -- | -- | -- | -- | 14 | -- | -- | 862 |
| Cloud | 35,873 | -- | 6,038 | -- | -- | -- | -- | -- | -- | 73 | -- | -- | 2,585 |
| Comanche | 2,345 | -- | 301 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 432 |
| Decatur | 6,697 | -- | 1,325 | -- | -- | -- | -- | -- | -- | 15 | -- | -- | 731 |
| Edwards | 7,705 | -- | 485 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 344 |
| Ellis | 8,435 | -- | 1,554 | -- | -- | -- | -- | -- | -- | 20 | -- | -- | 870 |
| Ellsworth | 11,318 | -- | 2,171 | -- | -- | -- | -- | -- | -- | 23 | -- | -- | 1,050 |
| Finney | 644 | -- | 81 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 101 |
| Ford | 1,432 | -- | 199 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 342 |
| Gove | 566 | -- | 102 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 40 |
| Graham | 15,340 | -- | 2,689 | -- | -- | -- | -- | -- | -- | 25 | -- | -- | 1,652 |
| Grant | 331 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 77 |
| Gray | 4,729 | -- | 121 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 165 |
| Greeley | 64 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hamilton | 5,828 | -- | 799 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 928 |
| Harper | 16,007 | -- | 2,025 | -- | -- | -- | -- | -- | -- | 16 | -- | -- | 1,459 |
| Harvey | 4,100 | -- | 642 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 758 |
| Haskell | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hodgeman | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jewell | 25,079 | -- | 3,234 | -- | -- | -- | -- | -- | -- | 26 | -- | -- | 2,550 |
| Kearny | 1,100 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Kingman | 27,329 | -- | 3,139 | -- | -- | -- | -- | -- | -- | 16 | -- | -- | 2,410 |
| Kiowa | 850 | -- | 79 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 74 |
| Lane | 165 | -- | 39 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 37 |
| Lincoln | 11,431 | -- | 1,691 | -- | -- | -- | -- | -- | -- | 23 | -- | -- | 1,031 |
| Logan | 2,568 | -- | 497 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 306 |
| McPherson | 16,126 | -- | 1,932 | -- | -- | -- | -- | -- | -- | 27 | -- | -- | 998 |
| Meade | 5,470 | -- | 496 | -- | -- | -- | -- | -- | -- | 8 | -- | -- | 356 |
| Mitchell | 25,036 | -- | 4,064 | -- | -- | -- | -- | -- | -- | 23 | -- | -- | 2,837 |
| Morton | 5,124 | -- | 736 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 633 |
| Ness | 1,522 | -- | 381 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | 171 |
| Norton | 7,746 | -- | 1,556 | -- | -- | -- | -- | -- | -- | 10 | -- | -- | 1,149 |
| Osborne | 23,265 | -- | 4,119 | -- | -- | -- | -- | -- | -- | 33 | -- | -- | 2,272 |
| Ottawa | 23,679 | -- | 4,153 | -- | -- | -- | -- | -- | -- | 27 | -- | -- | 2,324 |
| Pawnee | 5,251 | -- | 552 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 561 |
| Phillips | 17,734 | -- | 2,360 | -- | -- | -- | -- | -- | -- | 24 | -- | -- | 2,036 |
| Pratt | 7,282 | -- | 618 | -- | -- | -- | -- | -- | -- | 10 | -- | -- | 317 |
| Rawlins | 6,538 | -- | 1,343 | -- | -- | -- | -- | -- | -- | 14 | -- | -- | 699 |
| Reno | 22,418 | -- | 2,891 | -- | -- | -- | -- | -- | -- | 12 | -- | -- | 2,254 |
| Republic | 26,504 | -- | 2,962 | -- | -- | -- | -- | -- | -- | 29 | -- | -- | 1,995 |
| Rice | 8,140 | -- | 568 | -- | -- | -- | -- | -- | -- | 4 | -- | -- | 366 |
| Rooks | 23,394 | -- | 3,188 | -- | -- | -- | -- | -- | -- | 21 | -- | -- | 2,240 |
| Rush | 329 | -- | 79 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 74 |
| Russell | 17,310 | -- | 2,649 | -- | -- | -- | -- | -- | -- | 32 | -- | -- | 1,245 |

(Table 45 continued on next page)

(Table 45 continued)

WESTERN UNIT

| County | Species group | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cottonwood | Basswood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
| Barber | 15,259 | -- | 415 | 192 | 473 | 386 | 1,827 | 30 | 454 |
| Barton | 1,719 | -- | 77 | 40 | 112 | 102 | 393 | -- | 93 |
| Cheyenne | 5,090 | -- | 256 | 86 | 210 | 282 | 856 | 14 | 213 |
| Clark | 11,764 | -- | 182 | 89 | 204 | 196 | 1,744 | -- | 135 |
| Cloud | 20,618 | -- | 1,111 | 517 | 628 | 759 | 2,588 | 114 | 842 |
| Comanche | 1,105 | -- | 43 | 39 | 51 | 31 | 300 | -- | 41 |
| Decatur | 3,156 | -- | 158 | 69 | 195 | 174 | 684 | 8 | 182 |
| Edwards | 6,147 | -- | 215 | 37 | 82 | 55 | 271 | -- | 65 |
| Ellis | 4,165 | -- | 192 | 106 | 271 | 218 | 811 | 8 | 220 |
| Ellsworth | 5,746 | -- | 284 | 129 | 216 | 296 | 1,055 | 45 | 303 |
| Finney | 258 | -- | 13 | -- | 14 | 5 | 161 | -- | 11 |
| Ford | 638 | -- | 33 | 31 | 35 | 13 | 114 | -- | 27 |
| Gove | 300 | -- | 10 | 8 | 16 | 18 | 56 | -- | 14 |
| Graham | 7,992 | -- | 377 | 168 | 368 | 354 | 1,300 | 37 | 378 |
| Grant | 239 | -- | -- | 15 | -- | -- | -- | -- | -- |
| Gray | 4,176 | -- | 20 | -- | 21 | 8 | 202 | -- | 16 |
| Greeley | 64 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hamilton | 2,482 | -- | 122 | 27 | 156 | 80 | 1,119 | -- | 111 |
| Harper | 9,683 | -- | 385 | 253 | 425 | 342 | 1,043 | 46 | 330 |
| Harvey | 1,958 | -- | 105 | 31 | 113 | 43 | 365 | -- | 85 |
| Haskell | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hodgeman | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Jewell | 12,891 | -- | 462 | 194 | 619 | 379 | 4,259 | 8 | 457 |
| Kearny | 703 | -- | -- | -- | -- | -- | 397 | -- | -- |
| Kingman | 17,522 | -- | 732 | 561 | 684 | 441 | 1,162 | 114 | 548 |
| Kiowa | 415 | -- | 13 | -- | 14 | 5 | 239 | -- | 11 |
| Lane | 45 | -- | 6 | -- | 7 | 3 | 23 | -- | 5 |
| Lincoln | 6,612 | -- | 258 | 147 | 249 | 284 | 884 | 15 | 237 |
| Logan | 1,218 | -- | 68 | 32 | 79 | 56 | 229 | 7 | 72 |
| McPherson | 10,841 | -- | 331 | 153 | 263 | 320 | 966 | 23 | 272 |
| Meade | 3,490 | -- | 86 | 43 | 100 | 83 | 736 | -- | 72 |
| Mitchell | 13,858 | -- | 587 | 459 | 480 | 428 | 1,548 | 135 | 617 |
| Morton | 2,415 | -- | 117 | 38 | 164 | 81 | 829 | -- | 107 |
| Ness | 674 | -- | 45 | 20 | 16 | 29 | 115 | 15 | 54 |
| Norton | 3,343 | -- | 215 | 76 | 236 | 154 | 776 | 15 | 216 |
| Osborne | 12,841 | -- | 510 | 238 | 446 | 421 | 1,718 | 88 | 579 |
| Ottawa | 12,643 | -- | 569 | 407 | 570 | 429 | 1,778 | 134 | 645 |
| Pawnee | 2,997 | -- | 77 | 46 | 93 | 59 | 788 | -- | 74 |
| Phillips | 10,058 | -- | 384 | 301 | 540 | 374 | 1,279 | 15 | 363 |
| Pratt | 5,532 | -- | 121 | 41 | 101 | 100 | 357 | -- | 85 |
| Rawlins | 3,059 | -- | 157 | 73 | 176 | 169 | 648 | 15 | 185 |
| Reno | 13,769 | -- | 525 | 431 | 539 | 290 | 1,132 | 97 | 478 |
| Republic | 16,771 | -- | 495 | 144 | 511 | 367 | 2,812 | 8 | 410 |
| Rice | 6,625 | -- | 122 | 44 | 47 | 52 | 218 | 15 | 79 |
| Rooks | 14,395 | -- | 465 | 239 | 413 | 362 | 1,538 | 67 | 461 |
| Rush | 88 | -- | 13 | -- | 14 | 5 | 45 | -- | 11 |
| Russell | 10,372 | -- | 374 | 159 | 319 | 342 | 1,414 | 37 | 367 |

(Table 45 continued on next page)

(Table 45 continued)

WESTERN UNIT

| County | All species | Species group |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Eastern redcedar | Bur oak | Select white oak | Other white oak | Select red oak | Other red oak | Select hickory | Other hickory | Pecan | Hard maple | Soft maple | Ash |
| Saline | 11,252 | -- | 2,194 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,194 |
| Scott | 478 | -- | 140 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 65 |
| Sedgwick | 24,861 | -- | 4,393 | -- | -- | -- | -- | -- | -- | 236 | -- | -- | 2,724 |
| Seward | 6,722 | -- | 833 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 531 |
| Sheridan | 4,337 | -- | 662 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 351 |
| Sherman | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Smith | 10,516 | -- | 1,881 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,182 |
| Stafford | 17,554 | -- | 603 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 500 |
| Stanton | 33 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stevens | 1,800 | -- | 364 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 231 |
| Sumner | 59,976 | -- | 8,970 | -- | -- | -- | -- | -- | -- | 524 | -- | -- | 4,329 |
| Thomas | 2,184 | -- | 102 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 40 |
| Trego | 4,218 | -- | 683 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 594 |
| Wallace | 301 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 77 |
| Wichita | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All counties | 630,070 | -- | 89,091 | -- | -- | -- | -- | -- | -- | 760 | -- | -- | 56,557 |
| All units | 2,566,229 | 10,871 | 286,120 | 107,383 | 36,531 | 133,457 | 118,665 | 43,047 | 24,649 | 28,043 | 6,280 | 87,834 | 135,760 |

(Table 45 continued)

(Table 45 continued)

WESTERN UNIT

| County | Species group |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  | Cotton-wood | Bass-wood | Elm | Black walnut | Willow | Boxelder | Hackberry | Sycamore | Other hardwoods |
| Saline | 5,630 | -- | 323 | 177 | 218 | 246 | 918 | 46 | 306 |
| Scott | 186 | -- | 18 | 6 | -- | 5 | 30 | 8 | 20 |
| Sedgwick | 13,145 | -- | 617 | 476 | 514 | 376 | 1,521 | 173 | 686 |
| Seward | 3,999 | -- | 144 | 88 | 192 | 189 | 620 | -- | 125 |
| Sheridan | 2,580 | -- | 82 | 48 | 105 | 89 | 317 | 9 | 95 |
| Sherman | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Smith | 5,156 | -- | 235 | 86 | 314 | 247 | 1,159 | -- | 256 |
| Stafford | 15,612 | -- | 177 | 62 | 100 | 84 | 334 | -- | 82 |
| Stanton | 33 | -- | -- | -- | -- | -- | -- | -- | -- |
| Stevens | 784 | -- | 46 | 16 | 61 | 47 | 202 | -- | 49 |
| Sumner | 37,459 | -- | 2,006 | 717 | 491 | 888 | 2,968 | 342 | 1,282 |
| Thomas | 1,921 | -- | 10 | 8 | 16 | 18 | 55 | -- | 14 |
| Trego | 2,150 | -- | 99 | 78 | 33 | 54 | 351 | 23 | 103 |
| Wallace | 208 | -- | -- | 16 | -- | -- | -- | -- | -- |
| Wichita | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| All counties | 374,599 | -- | 14,487 | 7,461 | 12,369 | 10,838 | 49,254 | 1,710 | 12,944 |
| All units | 610,060 | 25,763 | 69,531 | 169,979 | 47,901 | 22,839 | 299,581 | 105,631 | 96,304 |

Table 46.--Net volume of growing stock on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| Eastern redcedar | 4,591 | 1,439 | 1,215 | 477 | 839 | 324 | 96 | 65 | 136 | -- | -- | -- | -- |
| Total | 4,591 | 1,439 | 1,215 | 477 | 839 | 324 | 96 | 65 | 136 | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Bur oak | 60,920 | 2,198 | 2,324 | 3,154 | 2,604 | 3,405 | 5,089 | 6,032 | 6,287 | 6,816 | 14,098 | 7,866 | 1,047 |
| Select white oak | 34,121 | 3,307 | 4,442 | 5,893 | 4,970 | 3,837 | 3,537 | 2,306 | 1,953 | 1,115 | 2,167 | 594 | -- |
| Other white oak | 19,854 | 4,750 | 4,281 | 4,011 | 1,742 | 2,316 | 1,308 | 944 | 157 | 196 | 149 | -- | -- |
| Select red oak | 45,828 | 1,941 | 4,117 | 5,293 | 6,283 | 3,784 | 5,274 | 4,211 | 4,274 | 1,959 | 5,859 | 2,421 | 412 |
| Other red oak | 27,445 | 1,576 | 2,374 | 2,814 | 2,622 | 2,701 | 2,195 | 2,451 | 2,626 | 2,554 | 3,898 | 1,541 | 93 |
| Select hickory | 17,388 | 3,214 | 3,457 | 2,915 | 1,943 | 2,259 | 1,378 | 1,517 | 411 | 89 | 205 | -- | -- |
| Other hickory | 11,693 | 2,491 | 2,589 | 2,806 | 1,440 | 1,159 | 312 | 373 | 348 | 175 | -- | -- | -- |
| Pecan | 8,986 | 488 | 1,004 | 1,785 | 1,337 | 973 | 909 | 473 | 397 | 751 | 385 | 484 | -- |
| Hard maple | 3,120 | 484 | 928 | 538 | 459 | 279 | 49 | 43 | 99 | 113 | -- | 128 | -- |
| Soft maple | 21,011 | 485 | 1,432 | 1,263 | 1,223 | 2,418 | 2,280 | 2,252 | 1,912 | 1,684 | 3,312 | 1,555 | 1,195 |
| Ash | 61,700 | 6,832 | 10,408 | 9,328 | 5,756 | 6,807 | 5,240 | 5,475 | 3,276 | 2,333 | 5,709 | 536 | -- |
| Cottonwood | 134,292 | 2,596 | 4,036 | 9,107 | 10,066 | 12,328 | 11,475 | 9,290 | 10,605 | 5,880 | 24,423 | 20,287 | 14,199 |
| Basswood | 6,031 | 399 | 392 | 587 | 1,084 | 1,111 | 769 | 592 | 292 | 510 | 179 | -- | 116 |
| Elm | 30,599 | 6,595 | 5,638 | 4,192 | 2,243 | 2,720 | 1,645 | 1,437 | 1,242 | 1,284 | 2,577 | 942 | 84 |
| Black walnut | 57,868 | 8,104 | 6,807 | 10,891 | 9,541 | 8,487 | 6,036 | 3,835 | 1,536 | 1,596 | 574 | 461 | -- |
| Willow | 11,629 | 509 | 882 | 984 | 1,729 | 1,996 | 1,653 | 1,424 | 1,022 | 553 | 757 | -- | 120 |
| Boxelder | 10,376 | 1,836 | 2,027 | 1,495 | 1,890 | 1,081 | 713 | 771 | 258 | 222 | 83 | -- | -- |
| Hackberry | 86,674 | 8,452 | 9,246 | 10,782 | 10,624 | 10,137 | 10,498 | 7,995 | 5,698 | 4,246 | 5,800 | 3,196 | -- |
| Sycamore | 21,538 | 213 | 619 | 634 | 1,129 | 1,190 | 2,530 | 1,695 | 1,580 | 2,268 | 3,750 | 4,139 | 1,791 |
| Other hardwoods | 35,651 | 5,167 | 5,521 | 5,180 | 4,759 | 3,970 | 3,527 | 3,153 | 1,672 | 1,215 | 869 | 618 | -- |
| Total | 706,724 | 61,637 | 72,524 | 83,652 | 73,444 | 72,958 | 66,417 | 56,269 | 45,645 | 35,559 | 74,794 | 44,768 | 19,057 |
| All species | 711,315 | 63,076 | 73,739 | 84,129 | 74,283 | 73,282 | 66,513 | 56,334 | 45,781 | 35,559 | 74,794 | 44,768 | 19,057 |

Table 47.--Net volume of sawtimber on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 10,871 | 2,652 | 4,643 | 1,878 | 570 | 396 | 732 | -- | -- | -- | -- |
| Total | 10,871 | 2,652 | 4,643 | 1,878 | 570 | 396 | 732 | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 286,120 | -- | 15,105 | 19,451 | 29,982 | 33,074 | 32,861 | 38,333 | 74,977 | 36,996 | 5,341 |
| Select white oak | 107,383 | -- | 28,207 | 20,572 | 19,392 | 11,728 | 9,392 | 5,574 | 10,042 | 2,476 | -- |
| Other white oak | 36,531 | -- | 9,331 | 12,588 | 7,023 | 4,829 | 919 | 1,008 | 833 | -- | -- |
| Select red oak | 183,457 | -- | 34,179 | 21,851 | 29,427 | 28,500 | 25,576 | 9,396 | 24,613 | 8,358 | 1,557 |
| Other red oak | 118,665 | -- | 14,479 | 14,714 | 12,599 | 14,698 | 15,601 | 15,454 | 22,966 | 7,613 | 541 |
| Select hickory | 43,047 | -- | 11,086 | 12,107 | 7,457 | 8,251 | 2,565 | 512 | 1,069 | -- | -- |
| Other hickory | 24,649 | -- | 7,608 | 6,463 | 1,797 | 6,131 | 1,750 | 900 | -- | -- | -- |
| Pecan | 28,043 | -- | 7,187 | 4,722 | 4,398 | 2,471 | 1,885 | 3,412 | 1,565 | 2,403 | -- |
| Hard maple | 6,280 | -- | 2,572 | 1,442 | 399 | 196 | 479 | 510 | -- | 682 | -- |
| Soft maple | 87,834 | -- | 5,149 | 13,036 | 11,635 | 11,876 | 10,378 | 8,203 | 16,775 | 6,305 | 4,477 |
| Ash | 185,760 | -- | 29,445 | 36,821 | 29,065 | 30,050 | 17,417 | 11,779 | 29,130 | 2,053 | -- |
| Cottonwood | 610,060 | -- | 47,920 | 64,973 | 58,306 | 51,036 | 56,304 | 30,916 | 130,159 | 106,157 | 64,289 |
| Basswood | 25,763 | -- | 5,949 | 5,938 | 4,077 | 3,481 | 1,822 | 3,087 | 1,110 | -- | 299 |
| Elm | 69,531 | -- | 10,734 | 14,458 | 8,287 | 6,784 | 5,892 | 6,816 | 11,866 | 4,188 | 506 |
| Black walnut | 169,979 | -- | 51,197 | 45,359 | 32,738 | 20,232 | 7,497 | 8,302 | 3,188 | 1,466 | -- |
| Willow | 47,901 | -- | 8,763 | 10,110 | 8,234 | 8,262 | 5,535 | 2,651 | 3,706 | -- | 640 |
| Boxelder | 22,839 | -- | 8,390 | 5,347 | 3,667 | 2,896 | 1,257 | 1,065 | 217 | -- | -- |
| Hackberry | 299,581 | -- | 60,494 | 52,628 | 54,700 | 40,550 | 29,835 | 22,716 | 27,210 | 11,448 | -- |
| Sycamore | 105,631 | -- | 5,564 | 6,357 | 15,469 | 8,786 | 8,967 | 12,463 | 20,119 | 19,769 | 8,137 |
| Other hardwoods | 96,304 | -- | 22,973 | 19,744 | 16,999 | 15,093 | 8,712 | 5,916 | 4,213 | 2,654 | -- |
| Total | 2,555,358 | -- | 386,332 | 388,681 | 355,651 | 308,924 | 244,644 | 189,013 | 383,758 | 212,568 | 85,787 |
| All species | 2,566,229 | 2,652 | 390,975 | 390,559 | 356,221 | 309,320 | 245,376 | 189,013 | 383,758 | 212,568 | 85,787 |

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[1] International 1/4-inch rule.

Table 48.--Net volume of growing stock on commercial forest land by species group and forest type, Kansas, 1981

(In thousand cubic feet)

| Species | All types | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 4,591 | 2,592 | 617 | -- | 292 | 98 | -- | -- | 215 | 625 | 152 |
| Total | 4,591 | 2,592 | 617 | -- | 292 | 98 | -- | -- | 215 | 625 | 152 |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 60,920 | 171 | 29,078 | 381 | 3,613 | 4,874 | -- | -- | 22,347 | 393 | 63 |
| Select white oak | 34,121 | 791 | 29,061 | 65 | 708 | 1,745 | -- | -- | 1,366 | 385 | -- |
| Other white oak | 19,854 | 157 | 6,135 | 13,166 | 331 | -- | -- | -- | -- | 65 | -- |
| Select red oak | 45,828 | 80 | 36,845 | 979 | 815 | 2,291 | -- | -- | 3,435 | 1,383 | -- |
| Other red oak | 27,445 | -- | 22,561 | 1,684 | 365 | 1,233 | 34 | -- | 1,084 | 431 | 53 |
| Select hickory | 17,388 | 94 | 13,249 | 302 | 212 | 1,609 | -- | -- | 1,305 | 617 | -- |
| Other hickory | 11,693 | -- | 6,029 | 165 | 584 | 1,140 | -- | -- | 3,640 | 135 | -- |
| Pecan | 8,986 | -- | 7,408 | -- | 123 | 1,053 | -- | -- | 235 | 167 | -- |
| Hard maple | 3,120 | -- | 1,403 | -- | -- | 1,117 | -- | -- | 212 | 388 | -- |
| Soft maple | 21,011 | -- | 330 | -- | -- | 15,591 | 67 | -- | 4,845 | 178 | -- |
| Ash | 61,700 | -- | 6,647 | -- | 618 | 39,901 | 1,493 | 206 | 10,998 | 1,633 | 204 |
| Cottonwood | 134,292 | -- | 1,556 | -- | 640 | 34,107 | 90,065 | 383 | 5,166 | 1,675 | 700 |
| Basswood | 6,031 | -- | 2,883 | -- | 1,442 | 485 | 126 | -- | 468 | 627 | -- |
| Elm | 30,599 | 130 | 5,119 | -- | 1,274 | 11,901 | 654 | -- | 7,901 | 3,235 | 385 |
| Black walnut | 57,868 | 580 | 11,689 | 206 | 6,286 | 5,315 | 408 | -- | 30,528 | 2,747 | 109 |
| Willow | 11,629 | -- | 306 | -- | 53 | 9,065 | 913 | 567 | 465 | 141 | 119 |
| Boxelder | 10,376 | -- | 210 | -- | 200 | 7,007 | 360 | -- | 2,477 | 69 | 53 |
| Hackberry | 86,674 | 59 | 6,085 | 68 | 4,728 | 13,207 | 346 | -- | 60,377 | 1,423 | 381 |
| Sycamore | 21,538 | -- | 2,751 | -- | 279 | 7,551 | 242 | -- | 9,915 | 723 | 77 |
| Other hardwoods | 35,651 | 91 | 3,729 | 125 | 1,578 | 13,339 | 457 | -- | 11,763 | 4,078 | 491 |
| Total | 706,724 | 2,153 | 193,074 | 17,141 | 23,849 | 172,531 | 95,165 | 1,156 | 178,527 | 20,493 | 2,635 |
| All species | 711,315 | 4,745 | 193,691 | 17,141 | 24,141 | 172,629 | 95,165 | 1,156 | 178,742 | 21,118 | 2,787 |

Table 49.--Net volume of sawtimber on commercial forest land by species group and forest type, Kansas, 1981

(In thousand board feet)[1]

| Species | All types | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 10,871 | 7,523 | 1,649 | -- | -- | -- | -- | -- | 360 | 958 | 381 |
| Total | 10,871 | 7,523 | 1,649 | -- | -- | -- | -- | -- | 360 | 958 | 381 |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 286,120 | 571 | 126,292 | -- | 14,353 | 25,761 | -- | -- | 117,449 | 1,694 | -- |
| Select white oak | 107,383 | 3,423 | 86,530 | 339 | 1,721 | 6,867 | -- | -- | 7,072 | 1,431 | -- |
| Other white oak | 36,531 | 301 | 11,969 | 22,290 | 1,599 | -- | -- | -- | -- | 372 | -- |
| Select red oak | 183,457 | -- | 149,217 | 2,739 | 3,093 | 11,105 | -- | -- | 13,024 | 4,279 | -- |
| Other red oak | 118,665 | -- | 103,150 | 2,589 | 1,578 | 4,332 | -- | -- | 5,085 | 1,593 | 338 |
| Select hickory | 43,047 | -- | 29,052 | 1,427 | 1,004 | 7,077 | -- | -- | 3,105 | 1,382 | -- |
| Other hickory | 24,649 | -- | 12,535 | -- | -- | 3,760 | -- | -- | 8,025 | 329 | -- |
| Pecan | 28,043 | -- | 22,543 | -- | -- | 4,105 | -- | -- | 760 | 635 | -- |
| Hard maple | 6,280 | -- | 3,110 | -- | -- | 2,182 | -- | -- | -- | 988 | -- |
| Soft maple | 87,834 | -- | 2,030 | -- | -- | 65,063 | 335 | -- | 20,119 | 287 | -- |
| Ash | 185,760 | -- | 16,443 | -- | 1,473 | 118,802 | 2,463 | 369 | 43,785 | 1,623 | 802 |
| Cottonwood | 610,060 | -- | 6,366 | -- | 3,395 | 164,607 | 399,810 | 1,812 | 25,580 | 5,816 | 2,674 |
| Basswood | 25,763 | -- | 11,756 | -- | 6,659 | 2,638 | -- | -- | 1,579 | 3,131 | -- |
| Elm | 69,531 | 342 | 10,158 | -- | 2,544 | 27,533 | 1,447 | -- | 21,838 | 4,879 | 790 |
| Black walnut | 169,979 | 1,061 | 32,578 | -- | 14,329 | 14,742 | 523 | -- | 99,584 | 7,162 | -- |
| Willow | 47,901 | -- | 698 | -- | -- | 40,355 | 2,415 | 1,941 | 1,363 | 466 | 663 |
| Boxelder | 22,839 | -- | 589 | -- | 886 | 12,052 | 806 | -- | 8,506 | -- | -- |
| Hackberry | 299,581 | -- | 18,596 | 346 | 13,711 | 39,479 | 1,304 | -- | 222,890 | 2,627 | 628 |
| Sycamore | 105,631 | -- | 12,700 | -- | 1,232 | 38,961 | 904 | -- | 48,446 | 3,043 | 345 |
| Other hardwoods | 96,304 | -- | 11,222 | 302 | 3,165 | 36,662 | 205 | -- | 33,076 | 11,299 | 373 |
| Total | 2,555,358 | 5,698 | 667,534 | 30,032 | 70,742 | 626,083 | 410,212 | 4,122 | 681,286 | 53,036 | 6,613 |
| All species | 2,566,229 | 13,221 | 669,183 | 30,032 | 70,742 | 626,083 | 410,212 | 4,122 | 681,646 | 53,994 | 6,994 |

[1] International 1/4-inch rule.

Table 50.--Net volume of growing stock on commercial forest land by species group and ownership class, Kansas, 1981

(In thousand cubic feet)

| Species group | All classes | Ownership class | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | National forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
| SOFTWOODS | | | | | | | | |
| Eastern redcedar | 4,591 | -- | 52 | -- | -- | -- | 3,289 | 1,250 |
| Total | 4,591 | -- | 52 | -- | -- | -- | 3,289 | 1,250 |
| HARDWOODS | | | | | | | | |
| Bur oak | 60,920 | -- | 1,237 | -- | 282 | -- | 38,563 | 20,838 |
| Select white oak | 34,121 | -- | 978 | -- | -- | 200 | 18,816 | 14,127 |
| Other white oak | 19,854 | -- | 731 | -- | -- | -- | 14,227 | 4,896 |
| Select red oak | 45,828 | -- | 1,049 | -- | -- | -- | 27,348 | 17,431 |
| Other red oak | 27,445 | -- | 123 | -- | 3,041 | -- | 15,875 | 8,406 |
| Select hickory | 17,388 | -- | 616 | -- | 114 | -- | 8,230 | 8,428 |
| Other hickory | 11,693 | -- | 450 | -- | -- | -- | 6,696 | 4,547 |
| Pecan | 8,986 | -- | -- | -- | 91 | -- | 3,444 | 5,451 |
| Hard maple | 3,120 | -- | -- | -- | -- | -- | 737 | 2,383 |
| Soft maple | 21,011 | -- | 749 | -- | 1,566 | 659 | 11,177 | 6,860 |
| Ash | 61,700 | -- | 1,523 | -- | 941 | -- | 40,475 | 18,761 |
| Cottonwood | 134,292 | -- | 9,794 | 398 | 2,130 | -- | 73,053 | 48,917 |
| Basswood | 6,031 | -- | 98 | -- | -- | -- | 3,943 | 1,990 |
| Elm | 30,599 | -- | 1,192 | 58 | 139 | 130 | 17,944 | 11,136 |
| Black walnut | 57,868 | -- | 2,229 | -- | 66 | 223 | 36,723 | 18,627 |
| Willow | 11,629 | -- | 232 | -- | 32 | 443 | 7,763 | 3,159 |
| Boxelder | 10,376 | -- | 95 | -- | -- | 200 | 7,379 | 2,702 |
| Hackberry | 86,674 | -- | 3,628 | 180 | 92 | 990 | 55,798 | 25,986 |
| Sycamore | 21,538 | -- | 1,608 | -- | -- | -- | 15,703 | 4,227 |
| Other hardwoods | 35,651 | -- | 1,520 | 398 | 246 | 432 | 19,981 | 13,074 |
| Total | 706,724 | -- | 27,852 | 1,034 | 8,740 | 3,277 | 423,875 | 241,946 |
| All species | 711,315 | -- | 27,904 | 1,034 | 8,740 | 3,277 | 427,164 | 243,196 |

Table 51.--Net volume of sawtimber on commercial forest land by species group and ownership class, Kansas, 1981

(In thousand board feet)[1]

| Species group | All classes | Ownership class | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | National forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
| SOFTWOODS | | | | | | | | |
| Eastern redcedar | 10,871 | -- | -- | -- | -- | -- | 9,115 | 1,756 |
| Total | 10,871 | -- | -- | -- | -- | -- | 9,115 | 1,756 |
| HARDWOODS | | | | | | | | |
| Bur oak | 286,120 | -- | 5,909 | -- | 1,271 | -- | 180,540 | 98,400 |
| Select white oak | 107,383 | -- | 3,014 | -- | -- | -- | 65,965 | 38,404 |
| Other white oak | 36,531 | -- | 1,902 | -- | -- | -- | 25,810 | 8,819 |
| Select red oak | 183,457 | -- | 4,751 | -- | -- | -- | 105,393 | 73,313 |
| Other red oak | 118,665 | -- | -- | -- | 18,519 | -- | 69,966 | 30,180 |
| Select hickory | 43,047 | -- | 425 | -- | 286 | -- | 21,144 | 21,192 |
| Other hickory | 24,649 | -- | -- | -- | -- | -- | 14,218 | 10,431 |
| Pecan | 28,043 | -- | -- | -- | 541 | -- | 12,991 | 14,511 |
| Hard maple | 6,280 | -- | -- | -- | -- | -- | 1,617 | 4,663 |
| Soft maple | 87,834 | -- | 2,936 | -- | 8,597 | 2,004 | 44,993 | 29,304 |
| Ash | 185,760 | -- | 4,073 | -- | 4,798 | -- | 118,314 | 58,575 |
| Cottonwood | 610,060 | -- | 55,081 | 862 | -- | -- | 336,232 | 217,885 |
| Basswood | 25,763 | -- | 487 | -- | -- | -- | 17,069 | 8,207 |
| Elm | 69,531 | -- | 2,022 | -- | -- | 628 | 43,595 | 23,286 |
| Black walnut | 169,979 | -- | 9,998 | -- | 342 | 628 | 107,965 | 51,046 |
| Willow | 47,901 | -- | 831 | -- | -- | 2,064 | 31,674 | 13,332 |
| Boxelder | 22,839 | -- | -- | -- | -- | 886 | 16,780 | 5,173 |
| Hackberry | 299,581 | -- | 9,875 | 315 | 471 | 2,492 | 192,875 | 93,553 |
| Sycamore | 105,631 | -- | 9,068 | -- | -- | -- | 77,423 | 19,140 |
| Other hardwoods | 96,304 | -- | 5,351 | 1,513 | 1,591 | 1,970 | 49,455 | 36,424 |
| Total | 2,555,358 | -- | 115,723 | 2,690 | 36,416 | 10,672 | 1,534,019 | 855,838 |
| All species | 2,566,229 | -- | 115,723 | 2,690 | 36,416 | 10,672 | 1,543,134 | 857,594 |

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[1] International ¼-inch rule.

Table 52.--Net volume of growing stock on commercial forest land by forest type and stand-age class, Kansas, 1981

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Eastern redcedar-hardwood | 4,745 | 1,271 | 466 | -- | 589 | -- | 1,249 | -- | -- | -- | -- | -- | 1,170 | -- |
| Oak-hickory | 193,691 | 8,406 | 8,315 | 8,768 | 13,044 | 18,005 | 20,214 | 24,112 | 25,032 | 13,084 | 23,229 | 19,842 | 9,680 | 1,960 |
| Post-blackjack oak | 17,141 | 190 | 85 | 338 | 2,483 | 7,975 | 711 | 348 | 2,130 | 2,125 | -- | 756 | -- | -- |
| Upland plains hardwoods | 24,141 | 948 | 2,763 | 2,129 | 2,378 | 2,581 | 3,690 | 5,711 | 940 | 877 | -- | 444 | 1,680 | -- |
| Elm-ash-cottonwood | 172,629 | 6,963 | 11,248 | 5,593 | 11,614 | 9,464 | 36,007 | 28,026 | 27,281 | 19,496 | 8,459 | 8,478 | -- | -- |
| Cottonwood | 95,165 | 135 | 71 | 1,693 | 3,632 | 13,005 | 10,609 | 25,472 | 11,615 | 5,226 | 14,536 | 9,171 | -- | -- |
| Willow | 1,156 | -- | 761 | 270 | -- | -- | 125 | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 178,742 | 4,557 | 5,943 | 4,743 | 14,929 | 6,007 | 28,804 | 36,095 | 36,442 | 14,175 | 15,397 | 9,505 | 675 | 1,470 |
| Upland elm-ash-locust | 21,118 | 3,006 | 4,162 | 1,578 | 2,854 | 579 | 1,165 | 1,970 | 1,677 | 1,504 | 1,142 | 447 | 1,034 | -- |
| Nonstocked | 2,787 | 415 | 322 | 471 | 295 | -- | 842 | 119 | 280 | 43 | -- | -- | -- | -- |
| All types | 711,315 | 25,891 | 34,136 | 25,583 | 51,818 | 57,616 | 103,416 | 121,853 | 105,397 | 56,530 | 62,763 | 48,643 | 14,239 | 3,430 |

Table 53.--Net volume of sawtimber on commercial forest land by forest type and stand-age class, Kansas, 1981

(In thousand board feet)[1/]

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Eastern redcedar-hardwood | 13,221 | 2,209 | 876 | -- | 1,018 | -- | 4,308 | -- | -- | -- | -- | -- | 4,810 | -- |
| Oak-hickory | 669,183 | 29,466 | 25,406 | 17,915 | 23,341 | 37,797 | 44,030 | 87,036 | 99,907 | 57,366 | 104,212 | 90,533 | 42,054 | 10,120 |
| Post-blackjack oak | 30,032 | 517 | -- | -- | 1,222 | 6,406 | 1,653 | 1,071 | 8,419 | 7,290 | -- | 3,454 | -- | -- |
| Upland plains hardwoods | 70,742 | 767 | 4,978 | 3,868 | 4,176 | 4,392 | 14,329 | 23,320 | 4,463 | 3,394 | -- | 1,335 | 5,720 | -- |
| Elm-ash-cottonwood | 626,083 | 23,616 | 21,854 | 11,796 | 19,671 | 29,745 | 135,753 | 112,108 | 110,092 | 77,025 | 44,050 | 40,373 | -- | -- |
| Cottonwood | 410,212 | -- | 347 | 858 | 3,501 | 49,235 | 41,419 | 111,005 | 56,173 | 18,276 | 79,571 | 49,777 | -- | -- |
| Willow | 4,122 | -- | 3,144 | 328 | -- | -- | 650 | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 631,646 | 23,175 | 16,300 | 10,063 | 31,936 | 19,683 | 100,032 | 146,369 | 156,923 | 59,789 | 65,684 | 40,680 | 3,271 | 7,741 |
| Upland elm-ash-locust | 53,994 | 6,924 | 7,884 | 2,881 | 6,281 | 1,389 | 4,106 | 7,442 | 4,829 | 4,215 | 3,476 | 1,877 | 2,690 | -- |
| Nonstocked | 6,994 | 1,410 | 514 | 337 | 373 | -- | 2,513 | 663 | 958 | 216 | -- | -- | -- | -- |
| All types | 2,566,229 | 88,084 | 31,303 | 43,046 | 91,519 | 143,697 | 348,793 | 439,014 | 441,774 | 227,571 | 296,993 | 228,029 | 58,545 | 17,861 |

[1/] International 1/4-inch rule.

Table 54.--Net volume of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Kansas, 1981

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Eastern redcedar-hardwood | | | | | | | | | | | | | | | |
| Sawtimber | 1,870 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1,870 | -- | -- | -- |
| Poletimber | 1,138 | -- | -- | -- | -- | -- | -- | 589 | 549 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 1,737 | 32 | 133 | -- | 532 | 747 | 293 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 4,745 | 32 | 133 | -- | 532 | 747 | 293 | 589 | 549 | -- | -- | 1,870 | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 116,700 | -- | -- | 277 | 1,220 | 8,219 | 7,987 | 19,731 | 13,943 | 15,803 | 21,678 | 19,380 | 8,462 | -- | -- |
| Poletimber | 57,675 | -- | -- | -- | 315 | 1,494 | 4,337 | 9,117 | 12,038 | 5,511 | 5,420 | 15,255 | 4,188 | -- | -- |
| Sapling & seedling | 19,316 | 50 | 1,059 | 702 | 6,135 | 4,367 | 1,919 | 1,780 | 1,698 | 992 | 614 | -- | -- | -- | -- |
| All stands | 193,691 | 50 | 1,059 | 979 | 7,670 | 14,080 | 14,243 | 30,628 | 27,679 | 22,306 | 27,712 | 34,635 | 12,650 | -- | -- |
| Post-blackjack oak | | | | | | | | | | | | | | | |
| Sawtimber | 4,329 | -- | -- | 442 | -- | -- | 348 | 1,156 | 1,438 | 945 | -- | -- | -- | -- | -- |
| Poletimber | 11,805 | -- | -- | -- | -- | -- | -- | -- | 2,492 | 953 | 4,040 | 2,661 | 1,659 | -- | -- |
| Sapling & seedling | 1,007 | -- | -- | 85 | -- | -- | 137 | 190 | -- | -- | 595 | -- | -- | -- | -- |
| All stands | 17,141 | -- | -- | 527 | -- | -- | 485 | 1,346 | 3,930 | 1,898 | 4,635 | 2,661 | 1,659 | -- | -- |
| Upland plains hardwoods | | | | | | | | | | | | | | | |
| Sawtimber | 12,942 | -- | -- | -- | 425 | 1,437 | 649 | 1,821 | 2,075 | 3,021 | 1,562 | -- | 1,952 | -- | -- |
| Poletimber | 8,384 | -- | -- | 148 | -- | 563 | 1,677 | 1,178 | 379 | 896 | 2,220 | 1,323 | -- | -- | -- |
| Sapling & seedling | 2,815 | -- | -- | 401 | 420 | 708 | -- | 565 | 293 | 428 | -- | -- | -- | -- | -- |
| All stands | 24,141 | -- | -- | 549 | 845 | 2,708 | 2,326 | 3,564 | 2,747 | 4,345 | 3,782 | 1,323 | 1,952 | -- | -- |
| Elm-ash-cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 128,904 | -- | 260 | 1,342 | 2,960 | 7,752 | 6,741 | 12,361 | 14,166 | 4,976 | 11,827 | 29,083 | 23,239 | 14,197 | -- |
| Poletimber | 25,595 | -- | -- | 567 | -- | 965 | 3,058 | 3,908 | 2,611 | 5,801 | 2,089 | 5,894 | 702 | -- | -- |
| Sapling & seedling | 18,130 | 79 | 518 | 1,182 | 4,405 | 6,210 | 2,494 | 1,138 | 853 | 108 | 1,143 | -- | -- | -- | -- |
| All stands | 172,629 | 79 | 778 | 3,091 | 7,365 | 14,927 | 12,293 | 17,407 | 17,630 | 10,885 | 15,059 | 34,977 | 23,941 | 14,197 | -- |
| Cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 89,787 | -- | 153 | 661 | 478 | 3,153 | 5,217 | 1,106 | 10,047 | 1,779 | 6,722 | 12,604 | 26,647 | 9,885 | 11,335 |
| Poletimber | 4,175 | -- | -- | -- | -- | -- | 697 | -- | 1,317 | -- | 2,161 | -- | -- | -- | -- |
| Sapling & seedling | 1,203 | -- | 71 | -- | 135 | -- | -- | -- | -- | -- | 997 | -- | -- | -- | -- |
| All stands | 95,165 | -- | 224 | 661 | 513 | 3,153 | 5,914 | 1,106 | 11,364 | 1,779 | 9,880 | 12,604 | 26,647 | 9,885 | 11,335 |

(Table 54 continued on next page)

(Table 54 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Willow | | | | | | | | | | | | | | |
| Sawtimber | 125 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 125 | -- | -- | -- |
| Poletimber | 270 | -- | -- | -- | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 761 | -- | -- | -- | -- | -- | 761 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 1,156 | -- | -- | -- | 270 | -- | 761 | -- | -- | -- | -- | 125 | -- | -- | -- |
| Lowland plains hardwoods | | | | | | | | | | | | | | |
| Sawtimber | 142,626 | -- | -- | -- | 4,919 | 6,790 | 7,161 | 17,118 | 19,043 | 17,642 | 22,897 | 32,283 | 14,773 | -- | -- |
| Poletimber | 25,156 | -- | 342 | 401 | 530 | -- | 2,794 | 3,723 | 6,051 | 760 | 4,880 | 5,675 | -- | -- | -- |
| Sapling & seedling | 10,960 | -- | 417 | 1,012 | 2,241 | 1,889 | 784 | 2,880 | 1,737 | -- | -- | -- | -- | -- | -- |
| All stands | 178,742 | -- | 759 | 1,413 | 7,690 | 8,679 | 10,739 | 23,721 | 26,831 | 18,402 | 27,777 | 37,958 | 14,773 | -- | -- |
| Upland elm-ash-locust | | | | | | | | | | | | | | |
| Sawtimber | 8,765 | -- | -- | 114 | 879 | 363 | -- | 2,441 | 1,757 | 2,450 | 761 | -- | -- | -- | -- |
| Poletimber | 4,371 | -- | -- | -- | 265 | -- | 260 | 1,862 | 469 | -- | 809 | 706 | -- | -- | -- |
| Sapling & seedling | 7,982 | 50 | 1,332 | 589 | 1,278 | 1,555 | 925 | 855 | 867 | -- | 531 | -- | -- | -- | -- |
| All stands | 21,118 | 50 | 1,332 | 703 | 2,422 | 1,918 | 1,185 | 5,158 | 3,093 | 2,450 | 2,101 | 706 | -- | -- | -- |
| Nonstocked | 2,787 | 50 | 853 | 167 | 494 | 845 | 316 | 62 | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | |
| Sawtimber | 506,048 | -- | 413 | 2,836 | 10,881 | 27,714 | 28,103 | 55,734 | 62,469 | 46,616 | 65,447 | 95,345 | 75,073 | 24,082 | 11,335 |
| Poletimber | 138,569 | -- | 342 | 1,116 | 1,380 | 3,022 | 12,823 | 20,377 | 25,906 | 13,921 | 21,619 | 31,514 | 6,549 | -- | -- |
| Sapling & seedling | 63,911 | 211 | 3,530 | 3,971 | 15,146 | 15,476 | 7,313 | 7,408 | 5,448 | 1,528 | 3,880 | -- | -- | -- | -- |
| Nonstocked | 2,787 | 50 | 853 | 167 | 494 | 845 | 316 | 62 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 711,315 | 261 | 5,138 | 8,090 | 27,901 | 47,057 | 48,555 | 83,581 | 93,823 | 62,065 | 90,946 | 126,859 | 81,622 | 24,082 | 11,335 |

Table 55.--Net volume of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Kansas, 1981

(In thousand board feet)[1/]

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Eastern redcedar-hardwood | | | | | | | | | | | | | | | |
| Sawtimber | 7,551 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7,551 | -- | -- | -- |
| Poletimber | 2,585 | -- | -- | -- | -- | -- | -- | 1,018 | 1,567 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 3,085 | -- | -- | -- | 1,298 | 1,471 | 316 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 13,221 | -- | -- | -- | 1,298 | 1,471 | 316 | 1,018 | 1,567 | -- | -- | 7,551 | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 502,737 | -- | -- | 1,050 | 5,534 | 39,096 | 32,298 | 90,535 | 48,094 | 69,043 | 93,971 | 85,432 | 37,684 | -- | -- |
| Poletimber | 105,294 | -- | -- | -- | -- | 2,714 | 5,899 | 14,888 | 25,228 | 8,762 | 11,698 | 31,041 | 5,064 | -- | -- |
| Sapling & seedling | 61,152 | -- | 3,847 | 2,102 | 18,542 | 16,111 | 4,677 | 5,796 | 6,497 | 1,489 | 2,091 | -- | -- | -- | -- |
| All stands | 669,183 | -- | 3,847 | 3,152 | 24,076 | 57,921 | 42,874 | 111,219 | 79,819 | 79,294 | 107,760 | 116,473 | 42,748 | -- | -- |
| Post-blackjack oak | | | | | | | | | | | | | | | |
| Sawtimber | 16,894 | -- | -- | 2,867 | -- | -- | 1,071 | 3,522 | 5,805 | 3,629 | -- | -- | -- | -- | -- |
| Poletimber | 12,466 | -- | -- | -- | -- | -- | -- | -- | 3,301 | 1,598 | 6,275 | 1,292 | -- | -- | -- |
| Sapling & seedling | 672 | -- | -- | -- | -- | -- | 155 | 517 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 30,032 | -- | -- | 2,867 | -- | -- | 1,226 | 4,039 | 9,106 | 5,227 | 6,275 | 1,292 | -- | -- | -- |
| Upland plains hardwoods | | | | | | | | | | | | | | | |
| Sawtimber | 51,615 | -- | -- | -- | 2,251 | 6,023 | 1,966 | 7,783 | 7,644 | 11,715 | 8,257 | -- | 5,976 | -- | -- |
| Poletimber | 15,166 | -- | -- | -- | -- | 1,407 | 3,181 | 1,868 | -- | 1,784 | 4,513 | 2,413 | -- | -- | -- |
| Sapling & seedling | 3,961 | -- | -- | -- | 2,024 | 473 | -- | -- | 294 | 1,170 | -- | -- | -- | -- | -- |
| All stands | 70,742 | -- | -- | -- | 4,275 | 7,903 | 5,147 | 9,651 | 7,938 | 14,669 | 12,770 | 2,413 | 5,976 | -- | -- |
| Elm-ash-cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 529,475 | -- | 1,009 | 6,911 | 12,522 | 29,764 | 32,633 | 48,100 | 59,250 | 18,447 | 42,297 | 129,997 | 90,325 | 58,220 | -- |
| Poletimber | 48,220 | -- | -- | 1,235 | -- | 1,319 | 5,837 | 9,993 | 6,343 | 6,738 | 4,619 | 10,602 | 1,534 | -- | -- |
| Sapling & seedling | 48,388 | 522 | 1,258 | 3,608 | 10,344 | 14,628 | 9,053 | 2,458 | 735 | 225 | 5,557 | -- | -- | -- | -- |
| All stands | 626,083 | 522 | 2,267 | 11,754 | 22,866 | 45,711 | 47,523 | 60,551 | 66,328 | 25,410 | 52,473 | 140,599 | 91,859 | 58,220 | -- |
| Cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 406,054 | -- | 548 | 2,152 | 1,624 | 11,869 | 26,627 | 4,744 | 37,663 | 8,722 | 39,360 | 49,792 | 123,350 | 49,003 | 50,600 |
| Poletimber | 3,507 | -- | -- | -- | -- | -- | 554 | -- | 2,953 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 651 | -- | 347 | -- | -- | -- | -- | -- | -- | -- | 304 | -- | -- | -- | -- |
| All stands | 410,212 | -- | 895 | 2,152 | 1,624 | 11,869 | 27,181 | 4,744 | 40,616 | 8,722 | 39,664 | 49,792 | 123,350 | 49,003 | 50,600 |

(Table 55 continued on next page)

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[1/] International 1/4-inch rule.

(Table 55 continued)

| Forest type and stand-size class | All classes | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basal-area class (square feet per acre) | | | | | | | | | | | | | |
| Willow | | | | | | | | | | | | | | | |
| Sawtimber | 650 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 650 | -- | -- | -- |
| Poletimber | 328 | -- | -- | -- | 328 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 3,144 | -- | -- | -- | -- | -- | 3,144 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 4,122 | -- | -- | -- | 328 | -- | 3,144 | -- | -- | -- | -- | 650 | -- | -- | -- |
| Lowland plains hardwood | | | | | | | | | | | | | | | |
| Sawtimber | 593,421 | -- | -- | -- | 20,821 | 28,066 | 32,332 | 68,809 | 82,310 | 68,893 | 96,574 | 133,375 | 62,241 | -- | -- |
| Poletimber | 46,369 | -- | -- | 337 | 504 | -- | 2,809 | 8,551 | 10,447 | 1,701 | 10,832 | 11,188 | -- | -- | -- |
| Sapling & seedling | 41,856 | -- | 1,358 | 1,521 | 8,699 | 5,456 | 3,192 | 9,105 | 12,525 | -- | -- | -- | -- | -- | -- |
| All stands | 681,646 | -- | 1,358 | 1,858 | 30,024 | 33,522 | 38,333 | 86,465 | 105,282 | 70,594 | 107,406 | 144,563 | 62,241 | -- | -- |
| Upland elm-ash-locust | | | | | | | | | | | | | | | |
| Sawtimber | 28,725 | -- | -- | 262 | 3,638 | 1,120 | -- | 7,597 | 5,215 | 8,788 | 2,105 | -- | -- | -- | -- |
| Poletimber | 7,870 | -- | -- | -- | 195 | -- | 620 | 4,103 | 314 | -- | 1,243 | 1,395 | -- | -- | -- |
| Sapling & seedling | 17,399 | -- | 2,593 | 1,760 | 3,124 | 5,106 | 2,373 | 750 | 935 | -- | 758 | -- | -- | -- | -- |
| All stands | 53,994 | -- | 2,593 | 2,022 | 6,957 | 6,226 | 2,993 | 12,450 | 6,464 | 8,788 | 4,106 | 1,395 | -- | -- | -- |
| Nonstocked | 6,994 | -- | 3,140 | 586 | 1,316 | 1,783 | 169 | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 2,137,122 | -- | 1,557 | 13,242 | 46,390 | 115,938 | 126,927 | 231,090 | 245,981 | 189,237 | 282,564 | 406,797 | 319,576 | 107,223 | 50,600 |
| Poletimber | 241,805 | -- | -- | 1,572 | 1,027 | 5,440 | 18,900 | 40,421 | 50,153 | 20,583 | 39,180 | 57,931 | 6,598 | -- | -- |
| Sapling & seedling | 180,308 | 522 | 9,403 | 8,991 | 44,031 | 43,245 | 22,910 | 18,626 | 20,986 | 2,884 | 8,710 | -- | -- | -- | -- |
| Nonstocked | 6,994 | -- | 3,140 | 586 | 1,316 | 1,783 | 169 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 2,566,229 | 522 | 14,100 | 24,391 | 92,764 | 165,406 | 168,906 | 290,137 | 317,120 | 212,704 | 330,454 | 464,728 | 326,174 | 107,223 | 50,600 |

### Table 56.--Net volume of sawtimber on commercial forest land by species group and butt log-grade, Kansas, 1981

(In thousand board feet)[1]

| Species group | All grades | Log grade |  |  |  |
|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | Tie and timber |
| SOFTWOODS |  |  |  |  |  |
| Eastern redcedar | 10,871 | -- | -- | 9,288 | 1,583 |
| Total | 10,871 | -- | -- | 9,288 | 1,583 |
| HARDWOODS |  |  |  |  |  |
| Bur oak | 286,120 | 62,314 | 83,866 | 125,690 | 14,250 |
| Select white oak | 107,383 | 15,773 | 31,101 | 57,630 | 2,879 |
| Other white oak | 36,531 | 1,511 | 11,996 | 22,451 | 573 |
| Select red oak | 183,457 | 42,611 | 58,851 | 77,067 | 4,928 |
| Other red oak | 118,665 | 16,741 | 40,147 | 52,680 | 9,097 |
| Select hickory | 43,047 | 7,461 | 16,724 | 17,213 | 1,649 |
| Other hickory | 24,649 | 3,698 | 11,719 | 8,127 | 1,105 |
| Pecan | 28,043 | 11,015 | 6,254 | 10,774 | -- |
| Hard maple | 6,280 | 1,141 | 1,889 | 2,698 | 552 |
| Soft maple | 87,834 | 19,380 | 28,931 | 35,865 | 3,658 |
| Ash | 185,760 | 68,512 | 61,858 | 53,810 | 1,580 |
| Cottonwood | 610,060 | 326,242 | 136,913 | 136,314 | 10,591 |
| Basswood | 25,763 | 8,822 | 3,602 | 12,284 | 1,055 |
| Elm | 69,531 | 8,683 | 10,404 | 46,889 | 3,555 |
| Black walnut | 169,979 | 40,924 | 66,343 | 61,521 | 1,191 |
| Willow | 47,901 | 17,421 | 13,992 | 14,031 | 2,457 |
| Boxelder | 22,839 | -- | 5,456 | 15,893 | 1,490 |
| Hackberry | 299,581 | 89,384 | 96,672 | 103,430 | 10,095 |
| Sycamore | 105,631 | 60,261 | 30,246 | 14,175 | 949 |
| Other hardwoods | 96,304 | 7,671 | 30,719 | 53,286 | 4,628 |
| Total | 2,555,358 | 809,565 | 747,683 | 921,828 | 76,282 |
| All species | 2,566,229 | 809,565 | 747,683 | 931,116 | 77,865 |

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[1] International ¼-inch rule.

### Table 57.--Net volume of growing-stock trees by forest type and ground land use, Kansas, 1981

(In thousand cubic feet)

| Forest type | Ground land use |  |  |  |  |
|---|---|---|---|---|---|
|  | Pastured commercial forest | Unpastured commercial forest | Wooded strips | Windbreaks | Wooded pasture |
| Eastern redcedar-hardwood | 1,262 | 3,483 | 16,881 | -- | 1,449 |
| Oak-hickory | 48,040 | 145,651 | 2,309 | -- | 3,939 |
| Post-blackjack oak | 6,669 | 10,472 | -- | -- | -- |
| Upland plains hardwoods | 9,108 | 15,033 | 1,828 | 475 | 1,438 |
| Elm-ash-cottonwood | 27,954 | 144,675 | 36,157 | -- | 6,318 |
| Cottonwood | 25,286 | 69,879 | 3,676 | -- | 1,313 |
| Willow | -- | 1,156 | 1,336 | -- | -- |
| Lowland plains hardwoods | 33,580 | 145,162 | 12,652 | -- | 2,801 |
| Upland elm-ash-locust | 8,071 | 13,047 | 13,706 | -- | 2,924 |
| Nonstocked | 1,421 | 1,366 | 2,998 | -- | 3,247 |
| All types | 161,391 | 549,924 | 91,543 | 475 | 23,429 |

Table 58.--Net volume of black walnut, by land class and tree class, Kansas, 1981

| Tree class | Commercial forest | | Nonforest with trees | | | |
|---|---|---|---|---|---|---|
| | | | Wooded strips | | Other nonforest with trees | |
| | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet | Thousand board feet[1] |
| Growing stock | 57,868 | -- | 3,368 | -- | 2,133 | -- |
| Sawtimber | -- | 169,979 | -- | 8,669 | -- | 6,486 |
| Short-log cull | 5,495 | 13,121 | 685 | 991 | 573 | 909 |
| Rough and rotten cull | 5,384 | -- | 487 | -- | 755 | -- |
| All classes | 68,747 | 183,100 | 4,540 | 9,660 | 3,461 | 7,395 |

[1] International 1/4-inch rule.

Table 59.--Net volume of growing-stock and short-log trees on commercial forest land and wooded strips, by species group and Forest Survey Unit, Kansas, 1981

(In thousand cubic feet)

| | | Commercial forest land | | Wooded strips | |
|---|---|---|---|---|---|
| Species group | Total | Growing-stock trees | Short-log trees | Growing-stock trees | Short-log trees |
| | | ALL UNITS | | | |
| SOFTWOODS | | | | | |
| Eastern redcedar | 6,077 | 4,591 | 410 | 1,076 | -- |
| Total | 6,077 | 4,591 | 410 | 1,076 | -- |
| HARDWOODS | | | | | |
| Bur oak | 78,929 | 60,920 | 6,634 | 11,301 | 74 |
| Select white oak | 39,284 | 34,121 | 4,875 | 258 | 30 |
| Other white oak | 21,641 | 19,854 | 1,787 | -- | -- |
| Select red oak | 49,432 | 45,828 | 1,755 | 1,658 | 191 |
| Other red oak | 30,416 | 27,445 | 2,097 | 874 | -- |
| Select hickory | 18,493 | 17,388 | 928 | 177 | -- |
| Other hickory | 13,399 | 11,693 | 934 | 733 | 39 |
| Pecan | 10,665 | 8,986 | 757 | 798 | 124 |
| Hard maple | 3,245 | 3,120 | 125 | -- | -- |
| Soft maple | 25,042 | 21,011 | 1,078 | 2,953 | -- |
| Ash | 80,493 | 61,700 | 5,446 | 11,082 | 2,265 |
| Cottonwood | 162,335 | 134,292 | 4,011 | 24,032 | -- |
| Basswood | 7,109 | 6,031 | 734 | 344 | -- |
| Elm | 44,980 | 30,599 | 8,010 | 5,154 | 1,217 |
| Black walnut | 67,416 | 57,868 | 5,495 | 3,368 | 685 |
| Willow | 14,014 | 11,629 | 821 | 1,475 | 89 |
| Boxelder | 17,609 | 10,376 | 3,487 | 2,174 | 1,572 |
| Hackberry | 109,599 | 86,674 | 9,118 | 12,710 | 1,097 |
| Sycamore | 26,445 | 21,538 | 250 | 4,657 | -- |
| Other hardwoods | 52,671 | 35,651 | 8,677 | 6,719 | 1,624 |
| Total | 873,217 | 706,724 | 67,019 | 90,467 | 9,007 |
| All species | 879,294 | 711,315 | 67,429 | 91,543 | 9,007 |
| | | NORTHEASTERN UNIT | | | |
| SOFTWOODS | | | | | |
| Eastern redcedar | 2,851 | 2,446 | 225 | 180 | -- |
| Total | 2,851 | 2,446 | 225 | 180 | -- |
| HARDWOODS | | | | | |
| Bur oak | 34,479 | 29,902 | 3,708 | 869 | -- |
| Select white oak | 25,682 | 22,050 | 3,602 | -- | 30 |
| Other white oak | 2,315 | 2,107 | 208 | -- | -- |
| Select red oak | 26,738 | 25,577 | 911 | 250 | -- |
| Other red oak | 16,583 | 15,385 | 788 | 410 | -- |
| Select hickory | 12,395 | 11,801 | 430 | 164 | -- |
| Other hickory | 7,690 | 6,665 | 719 | 267 | 39 |
| Pecan | 265 | 265 | -- | -- | -- |
| Hard maple | 1,938 | 1,938 | -- | -- | -- |
| Soft maple | 13,003 | 10,459 | 633 | 1,911 | -- |
| Ash | 18,511 | 13,845 | 1,283 | 3,159 | 224 |
| Cottonwood | 48,389 | 43,561 | 1,017 | 3,811 | -- |
| Basswood | 6,696 | 5,618 | 734 | 344 | -- |
| Elm | 19,950 | 13,932 | 3,066 | 2,571 | 381 |
| Black walnut | 37,917 | 32,366 | 2,945 | 1,959 | 647 |
| Willow | 6,204 | 5,021 | 235 | 948 | -- |
| Boxelder | 6,169 | 3,563 | 865 | 1,191 | 550 |
| Hackberry | 45,013 | 37,640 | 2,871 | 3,883 | 619 |
| Sycamore | 14,808 | 11,447 | 26 | 3,335 | -- |
| Other hardwoods | 30,233 | 19,505 | 4,520 | 5,347 | 861 |
| Total | 374,978 | 312,647 | 28,561 | 30,419 | 3,351 |
| All species | 377,829 | 315,093 | 28,786 | 30,599 | 3,351 |

(Table 59 continued on next page)

(Table 59 continued)

| Species group | Total | Commercial forest land | | Wooded strips | |
|---|---|---|---|---|---|
| | | Growing-stock trees | Short-log trees | Growing-stock trees | Short-log trees |
| SOUTHEASTERN UNIT | | | | | |
| SOFTWOODS | | | | | |
| Eastern redcedar | 2,297 | 2,112 | 185 | -- | -- |
| Total | 2,297 | 2,112 | 185 | -- | -- |
| HARDWOODS | | | | | |
| Bur oak | 19,183 | 15,644 | 1,613 | 1,852 | 74 |
| Select white oak | 13,602 | 12,071 | 1,273 | 258 | -- |
| Other white oak | 19,326 | 17,747 | 1,579 | -- | -- |
| Select red oak | 22,694 | 20,251 | 844 | 1,408 | 191 |
| Other red oak | 13,833 | 12,060 | 1,309 | 464 | -- |
| Select hickory | 6,098 | 5,587 | 498 | 13 | -- |
| Other hickory | 5,709 | 5,028 | 215 | 466 | -- |
| Pecan | 10,257 | 8,578 | 757 | 798 | 124 |
| Hard maple | 1,307 | 1,182 | 125 | -- | -- |
| Soft maple | 11,912 | 10,552 | 318 | 1,042 | -- |
| Ash | 30,634 | 26,734 | 1,759 | 1,232 | 909 |
| Cottonwood | 11,272 | 9,786 | 438 | 1,048 | -- |
| Basswood | 413 | 413 | -- | -- | -- |
| Elm | 19,065 | 12,589 | 3,150 | 2,490 | 836 |
| Black walnut | 26,920 | 23,004 | 2,469 | 1,409 | 38 |
| Willow | 4,860 | 4,204 | 284 | 283 | 89 |
| Boxelder | 4,114 | 1,831 | 708 | 983 | 592 |
| Hackberry | 45,226 | 38,441 | 2,275 | 4,328 | 182 |
| Sycamore | 11,333 | 9,787 | 224 | 1,322 | -- |
| Other hardwoods | 15,694 | 11,527 | 2,032 | 1,372 | 763 |
| Total | 293,452 | 247,016 | 21,870 | 20,768 | 3,798 |
| All species | 295,749 | 249,128 | 22,055 | 20,768 | 3,798 |
| WESTERN UNIT | | | | | |
| SOFTWOODS | | | | | |
| Eastern redcedar | 929 | 33 | -- | 896 | -- |
| Total | 929 | 33 | -- | 896 | -- |
| HARDWOODS | | | | | |
| Bur oak | 25,267 | 15,374 | 1,313 | 8,580 | -- |
| Select white oak | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- |
| Select red oak | -- | -- | -- | -- | -- |
| Other red oak | -- | -- | -- | -- | -- |
| Select hickory | -- | -- | -- | -- | -- |
| Other hickory | -- | -- | -- | -- | -- |
| Pecan | 143 | 143 | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- |
| Soft maple | 127 | -- | 127 | -- | -- |
| Ash | 31,348 | 21,121 | 2,404 | 6,691 | 1,132 |
| Cottonwood | 102,674 | 80,945 | 2,556 | 19,173 | -- |
| Basswood | -- | -- | -- | -- | -- |
| Elm | 5,965 | 4,078 | 1,794 | 93 | -- |
| Black walnut | 2,579 | 2,498 | 81 | -- | -- |
| Willow | 2,950 | 2,404 | 302 | 244 | -- |
| Boxelder | 7,326 | 4,982 | 1,914 | -- | 430 |
| Hackberry | 19,360 | 10,593 | 3,972 | 4,499 | 296 |
| Sycamore | 304 | 304 | -- | -- | -- |
| Other hardwoods | 6,744 | 4,619 | 2,125 | -- | -- |
| Total | 204,787 | 147,061 | 16,588 | 39,280 | 1,858 |
| All species | 205,716 | 147,094 | 16,588 | 40,176 | 1,858 |

Table 60.--Net volume of sawtimber and short-log trees on commercial forest land and wooded strips, by species group and Forest Survey Unit, Kansas, 1981

(In thousand board feet)[1]

| | | Commercial forest land | | Wooded strips | |
|---|---|---|---|---|---|
| Species group | Total | Sawtimber trees | Short-log trees | Sawtimber trees | Short-log trees |
| | | ALL UNITS | | | |
| SOFTWOODS | | | | | |
| Eastern redcedar | 12,870 | 10,871 | 779 | 1,220 | -- |
| Total | 12,870 | 10,871 | 779 | 1,220 | -- |
| HARDWOODS | | | | | |
| Bur oak | 350,299 | 286,120 | 16,080 | 48,099 | -- |
| Select white oak | 119,652 | 107,383 | 12,269 | -- | -- |
| Other white oak | 38,525 | 36,531 | 1,994 | -- | -- |
| Select red oak | 192,823 | 183,457 | 4,733 | 4,633 | -- |
| Other red oak | 128,529 | 118,665 | 6,328 | 3,536 | -- |
| Select hickory | 44,878 | 43,047 | 1,831 | -- | -- |
| Other hickory | 27,293 | 24,649 | 1,685 | 959 | -- |
| Pecan | 33,204 | 28,043 | 1,903 | 2,860 | 398 |
| Hard maple | 6,613 | 6,280 | 333 | -- | -- |
| Soft maple | 101,089 | 87,834 | 2,571 | 10,684 | -- |
| Ash | 236,913 | 185,760 | 11,798 | 34,894 | 4,461 |
| Cottonwood | 707,410 | 610,060 | 13,704 | 83,646 | -- |
| Basswood | 28,141 | 25,763 | 1,571 | 807 | -- |
| Elm | 92,790 | 69,531 | 12,387 | 9,199 | 1,673 |
| Black walnut | 192,760 | 169,979 | 13,121 | 8,669 | 991 |
| Willow | 57,075 | 47,901 | 2,355 | 6,433 | 386 |
| Boxelder | 39,152 | 22,839 | 7,992 | 5,125 | 3,196 |
| Hackberry | 363,523 | 299,581 | 21,596 | 41,472 | 874 |
| Sycamore | 120,423 | 105,631 | 370 | 14,422 | -- |
| Other hardwoods | 135,631 | 96,304 | 12,504 | 23,399 | 3,424 |
| Total | 3,016,723 | 2,555,358 | 147,125 | 298,837 | 15,403 |
| All species | 3,029,593 | 2,566,229 | 147,904 | 300,057 | 15,403 |
| | | NORTHEASTERN UNIT | | | |
| SOFTWOODS | | | | | |
| Eastern redcedar | 5,209 | 5,106 | 103 | -- | -- |
| Total | 5,209 | 5,106 | 103 | -- | -- |
| HARDWOODS | | | | | |
| Bur oak | 136,514 | 124,290 | 8,605 | 3,619 | -- |
| Select white oak | 87,258 | 77,476 | 9,782 | -- | -- |
| Other white oak | 6,476 | 6,145 | 331 | -- | -- |
| Select red oak | 106,363 | 104,284 | 2,079 | -- | -- |
| Other red oak | 76,262 | 70,133 | 3,922 | 2,207 | -- |
| Select hickory | 24,651 | 24,060 | 591 | -- | -- |
| Other hickory | 15,851 | 14,453 | 1,398 | -- | -- |
| Pecan | 575 | 575 | -- | -- | -- |
| Hard maple | 3,635 | 3,635 | -- | -- | -- |
| Soft maple | 53,320 | 44,464 | 1,384 | 7,472 | -- |
| Ash | 57,355 | 42,154 | 2,698 | 12,186 | 317 |
| Cottonwood | 212,554 | 196,103 | 2,572 | 13,879 | -- |
| Basswood | 27,185 | 24,807 | 1,571 | 807 | -- |
| Elm | 33,538 | 25,507 | 3,148 | 4,536 | 347 |
| Black walnut | 111,345 | 96,526 | 8,285 | 5,543 | 991 |
| Willow | 23,260 | 19,065 | 257 | 3,938 | -- |
| Boxelder | 9,787 | 5,924 | 1,818 | 1,129 | 916 |
| Hackberry | 133,687 | 112,814 | 8,586 | 11,413 | 874 |
| Sycamore | 64,790 | 56,268 | -- | 8,522 | -- |
| Other hardwoods | 81,192 | 53,824 | 6,979 | 18,801 | 1,588 |
| Total | 1,265,598 | 1,102,507 | 64,006 | 94,052 | 5,033 |
| All species | 1,270,807 | 1,107,613 | 64,109 | 94,052 | 5,033 |

(Table 60 continued on next page)

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[1] International ¼-inch rule.

(Table 60 continued)

SOUTHEASTERN UNIT

| Species group | Total | Commercial forest land | | Wooded strips | |
|---|---|---|---|---|---|
| | | Growing-stock trees | Short-log trees | Growing-stock trees | Short-log trees |
| SOFTWOODS | | | | | |
| Eastern redcedar | 6,441 | 5,765 | 676 | -- | -- |
| Total | 6,441 | 5,765 | 676 | -- | -- |
| HARDWOODS | | | | | |
| Bur oak | 83,901 | 72,739 | 3,331 | 7,831 | -- |
| Select white oak | 32,394 | 29,907 | 2,487 | -- | -- |
| Other white oak | 32,049 | 30,386 | 1,663 | -- | -- |
| Select red oak | 86,460 | 79,173 | 2,654 | 4,633 | -- |
| Other red oak | 52,267 | 48,532 | 2,406 | 1,329 | -- |
| Select hickory | 20,227 | 18,987 | 1,240 | -- | -- |
| Other hickory | 11,442 | 10,196 | 287 | 959 | -- |
| Pecan | 31,869 | 26,708 | 1,903 | 2,860 | 398 |
| Hard maple | 2,978 | 2,645 | 333 | -- | -- |
| Soft maple | 47,363 | 43,370 | 781 | 3,212 | -- |
| Ash | 96,218 | 87,049 | 3,406 | 3,867 | 1,896 |
| Cottonwood | 45,351 | 39,358 | 1,244 | 4,749 | -- |
| Basswood | 956 | 956 | -- | -- | -- |
| Elm | 40,542 | 29,537 | 5,016 | 4,663 | 1,326 |
| Black walnut | 73,954 | 65,992 | 4,836 | 3,126 | -- |
| Willow | 18,858 | 16,467 | 637 | 1,368 | 386 |
| Boxelder | 13,231 | 6,077 | 1,488 | 3,996 | 1,670 |
| Hackberry | 158,074 | 137,513 | 5,239 | 15,322 | -- |
| Sycamore | 53,923 | 47,653 | 370 | 5,900 | -- |
| Other hardwoods | 38,647 | 29,536 | 2,677 | 4,598 | 1,836 |
| Total | 940,704 | 822,781 | 41,998 | 68,413 | 7,512 |
| All species | 947,145 | 828,546 | 42,674 | 68,413 | 7,512 |

WESTERN UNIT

| Species group | Total | Commercial forest land | | Wooded strips | |
|---|---|---|---|---|---|
| | | Growing-stock trees | Short-log trees | Growing-stock trees | Short-log trees |
| SOFTWOODS | | | | | |
| Eastern redcedar | 1,220 | -- | -- | 1,220 | -- |
| Total | 1,220 | -- | -- | 1,220 | -- |
| HARDWOODS | | | | | |
| Bur oak | 129,884 | 89,091 | 4,144 | 36,649 | -- |
| Select white oak | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- |
| Select red oak | -- | -- | -- | -- | -- |
| Other red oak | -- | -- | -- | -- | -- |
| Select hickory | -- | -- | -- | -- | -- |
| Other hickory | -- | -- | -- | -- | -- |
| Pecan | 760 | 760 | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- |
| Soft maple | 406 | -- | 406 | -- | -- |
| Ash | 83,340 | 56,557 | 5,694 | 18,841 | 2,248 |
| Cottonwood | 449,505 | 374,599 | 9,888 | 65,018 | -- |
| Basswood | -- | -- | -- | -- | -- |
| Elm | 18,710 | 14,487 | 4,223 | -- | -- |
| Black walnut | 7,461 | 7,461 | -- | -- | -- |
| Willow | 14,957 | 12,369 | 1,461 | 1,127 | -- |
| Boxelder | 16,134 | 10,838 | 4,686 | -- | 610 |
| Hackberry | 71,762 | 49,254 | 7,771 | 14,737 | -- |
| Sycamore | 1,710 | 1,710 | -- | -- | -- |
| Other hardwoods | 15,792 | 12,944 | 2,848 | -- | -- |
| Total | 810,421 | 630,070 | 41,121 | 136,372 | 2,858 |
| All species | 811,641 | 630,070 | 41,121 | 137,592 | 2,858 |

Table 61.--Net volume of short-log trees on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| Eastern redcedar | 410 | 97 | 176 | 25 | -- | 85 | 27 | -- | -- | -- | -- | -- | -- |
| Total | 410 | 97 | 176 | 25 | -- | 85 | 27 | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Bur oak | 6,634 | 219 | 120 | 476 | 481 | 347 | 352 | 596 | 215 | 607 | 1,752 | 981 | 488 |
| Select white oak | 4,875 | 422 | 734 | 1,080 | 799 | 365 | 539 | 234 | 141 | 142 | 370 | 49 | -- |
| Other white oak | 1,787 | 543 | 406 | 303 | 422 | -- | 50 | -- | -- | -- | 63 | -- | -- |
| Select red oak | 1,755 | 104 | 156 | 278 | 353 | 371 | 160 | -- | 159 | 92 | 56 | 26 | -- |
| Other red oak | 2,097 | 176 | 446 | 234 | 644 | 135 | 211 | 147 | -- | -- | 104 | -- | -- |
| Select hickory | 928 | 231 | 159 | 62 | -- | 246 | 53 | -- | 114 | 63 | -- | -- | -- |
| Other hickory | 934 | 125 | 178 | 184 | 270 | 51 | -- | -- | -- | -- | 126 | -- | -- |
| Pecan | 757 | 94 | 32 | -- | 55 | 99 | 73 | 195 | 76 | 133 | -- | -- | -- |
| Hard maple | 125 | 36 | -- | -- | 89 | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 1,078 | -- | -- | 142 | 208 | 127 | 124 | 83 | 83 | -- | 216 | 95 | -- |
| Ash | 5,446 | 312 | 912 | 848 | 584 | 793 | 855 | 316 | 370 | 46 | 510 | -- | -- |
| Cottonwood | 4,011 | -- | 178 | 217 | 1,140 | 150 | 438 | 116 | 280 | 317 | 184 | 684 | 307 |
| Basswood | 734 | -- | -- | 160 | 192 | 64 | 112 | -- | 82 | -- | 61 | 63 | -- |
| Elm | 8,010 | 1,641 | 1,788 | 1,097 | 821 | 631 | 537 | 318 | 267 | 119 | 586 | 205 | -- |
| Black walnut | 5,495 | 752 | 603 | 1,060 | 1,048 | 840 | 497 | 165 | 277 | 180 | 73 | -- | -- |
| Willow | 821 | 80 | -- | 167 | 155 | 149 | 59 | 111 | 100 | -- | -- | -- | -- |
| Boxelder | 3,487 | 307 | 525 | 466 | 256 | 416 | 565 | 672 | 180 | -- | -- | -- | -- |
| Hackberry | 9,118 | 862 | 1,390 | 1,029 | 1,718 | 1,533 | 889 | 499 | 390 | 292 | 354 | 162 | -- |
| Sycamore | 250 | -- | 140 | -- | 49 | -- | 61 | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 8,677 | 1,958 | 2,059 | 1,092 | 841 | 923 | 525 | 309 | 225 | 324 | 319 | 42 | 60 |
| Total | 67,019 | 7,862 | 9,726 | 8,895 | 10,125 | 7,240 | 6,200 | 3,761 | 2,959 | 2,315 | 4,774 | 2,307 | 855 |
| All species | 67,429 | 7,959 | 9,902 | 8,920 | 10,125 | 7,325 | 6,227 | 3,761 | 2,959 | 2,315 | 4,774 | 2,307 | 855 |

Table 62.--Net volume of short-log trees on commercial forest land by species group and diameter class, Kansas, 1981

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 779 | 103 | -- | 173 | 503 | -- | -- | -- | -- | -- | -- |
| Total | 779 | 103 | -- | 173 | 503 | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 16,080 | -- | 2,480 | 1,379 | 1,419 | 1,830 | 589 | 1,583 | 4,580 | 1,657 | 563 |
| Select white oak | 12,269 | -- | 5,010 | 1,447 | 3,329 | 707 | 396 | 267 | 920 | 193 | -- |
| Other white oak | 1,994 | -- | 1,715 | -- | 159 | -- | -- | -- | 120 | -- | -- |
| Select red oak | 4,733 | -- | 1,505 | 1,462 | 765 | -- | 392 | 315 | 233 | 61 | -- |
| Other red oak | 6,328 | -- | 4,089 | 550 | 923 | 556 | -- | -- | 210 | -- | -- |
| Select hickory | 1,831 | -- | -- | 925 | 177 | -- | 434 | 295 | -- | -- | -- |
| Other hickory | 1,685 | -- | 885 | 287 | -- | -- | -- | -- | 513 | -- | -- |
| Pecan | 1,903 | -- | 203 | 302 | 243 | 698 | 71 | 386 | -- | -- | -- |
| Hard maple | 333 | -- | 333 | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 2,571 | -- | 667 | 406 | 348 | 38 | 222 | -- | 721 | 169 | -- |
| Ash | 11,798 | -- | 2,013 | 2,947 | 2,458 | 1,573 | 1,069 | 129 | 1,609 | -- | -- |
| Cottonwood | 13,704 | -- | 4,272 | 600 | 1,380 | 421 | 1,170 | 1,768 | 666 | 2,210 | 1,217 |
| Basswood | 1,571 | -- | 584 | 185 | 299 | -- | 340 | -- | 94 | 69 | -- |
| Elm | 12,387 | -- | 3,049 | 2,026 | 2,041 | 1,314 | 804 | 334 | 2,008 | 811 | -- |
| Black walnut | 13,121 | -- | 4,019 | 4,847 | 1,666 | 542 | 1,126 | 635 | 286 | -- | -- |
| Willow | 2,355 | -- | 472 | 892 | 209 | 430 | 352 | -- | -- | -- | -- |
| Boxelder | 7,992 | -- | 888 | 1,682 | 2,221 | 2,386 | 815 | -- | -- | -- | -- |
| Hackberry | 21,596 | -- | 8,014 | 6,146 | 2,714 | 1,815 | 923 | 690 | 1,004 | 290 | -- |
| Sycamore | 370 | -- | 149 | -- | 221 | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 12,504 | -- | 3,296 | 3,412 | 2,132 | 1,249 | 574 | 692 | 1,007 | 67 | 75 |
| Total | 147,125 | -- | 43,643 | 29,495 | 22,704 | 13,559 | 9,277 | 7,094 | 13,971 | 5,527 | 1,855 |
| All species | 147,904 | 103 | 43,643 | 29,668 | 23,207 | 13,559 | 9,277 | 7,094 | 13,971 | 5,527 | 1,855 |

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[1] International 1/4-inch rule.

Table 63.--Net volume of all live trees on wooded strips by species group and diameter class, Kansas, 1981

(In thousand cubic feet)

| Species group | All classes | Diameter class (inches at breast height) 5.0-6.9 | 7.0-8.9 | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | | | |
| Eastern redcedar | 1,186 | 390 | 574 | 222 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,186 | 390 | 574 | 222 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | | | |
| Bur oak | 11,408 | 61 | -- | 136 | 148 | 141 | -- | -- | -- | 638 | 10,284 | -- | -- |
| Select white oak | 382 | 289 | -- | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oak | 1,915 | 157 | 99 | 567 | 379 | 157 | -- | -- | -- | -- | 556 | -- | -- |
| Other red oak | 961 | 68 | 49 | 104 | 172 | 481 | -- | -- | 87 | -- | -- | -- | -- |
| Select hickory | 177 | 177 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hickory | 815 | 51 | 274 | 268 | 222 | -- | -- | -- | -- | -- | -- | -- | -- |
| Pecan | 921 | -- | -- | 136 | 135 | 319 | -- | 331 | -- | -- | -- | -- | -- |
| Hard maple | 34 | 34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 3,878 | 364 | 311 | 392 | 98 | -- | 247 | 316 | 406 | 924 | 775 | 45 | -- |
| Ash | 18,985 | 2,132 | 2,350 | 2,300 | 2,162 | 1,694 | 3,103 | 640 | -- | 4,604 | -- | -- | -- |
| Cottonwood | 25,747 | 159 | 424 | 389 | 905 | 587 | 1,320 | 1,167 | 1,488 | 3,205 | 2,980 | 13,054 | 69 |
| Basswood | 544 | 53 | 45 | 97 | 150 | 199 | -- | -- | -- | -- | -- | -- | -- |
| Elm | 9,382 | 2,556 | 1,392 | 1,970 | 919 | 910 | 776 | 814 | -- | 45 | -- | -- | -- |
| Black walnut | 4,540 | 770 | 894 | 536 | 414 | 957 | 241 | 648 | -- | 48 | 32 | -- | -- |
| Willow | 1,980 | 146 | 185 | 63 | 624 | 51 | -- | 96 | -- | 788 | 27 | -- | -- |
| Boxelder | 6,499 | 751 | 1,527 | 1,041 | 709 | 796 | 786 | 889 | -- | -- | -- | -- | -- |
| Hackberry | 15,704 | 2,201 | 1,670 | 1,353 | 1,722 | 1,400 | 932 | 685 | 1,632 | 483 | 3,549 | 77 | -- |
| Sycamore | 4,694 | -- | 74 | 84 | -- | -- | 213 | -- | -- | 1,072 | -- | 3,251 | -- |
| Other hardwoods | 11,180 | 1,181 | 1,249 | 1,185 | 952 | 1,107 | 745 | 951 | 964 | -- | 1,081 | 1,765 | -- |
| Noncommercial species | 5,854 | 1,338 | 1,309 | 1,052 | 539 | 152 | 277 | 487 | -- | 700 | -- | -- | -- |
| Total | 125,600 | 12,488 | 11,852 | 11,766 | 10,250 | 8,951 | 8,640 | 7,024 | 4,577 | 12,507 | 19,284 | 18,192 | 69 |
| All species | 126,786 | 12,878 | 12,426 | 11,988 | 10,250 | 8,951 | 8,640 | 7,024 | 4,577 | 12,507 | 19,284 | 18,192 | 69 |

Table 64.--Net volume of sawtimber on wooded strips by species group and diameter class, Kansas, 1981

(In thousand board feet)[1]

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 1,220 | 1,220 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,220 | 1,220 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 48,099 | -- | 805 | 741 | -- | -- | -- | 2,878 | 43,675 | -- | -- |
| Select white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oak | 4,633 | -- | 1,651 | 826 | -- | -- | -- | -- | 2,156 | -- | -- |
| Other red oak | 3,536 | -- | 909 | 2,627 | -- | -- | -- | -- | -- | -- | -- |
| Select hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hickory | 959 | -- | 959 | -- | -- | -- | -- | -- | -- | -- | -- |
| Pecan | 2,860 | -- | 664 | 861 | -- | 1,335 | -- | -- | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 10,684 | -- | 468 | -- | 1,094 | 1,589 | -- | 4,321 | 3,212 | -- | -- |
| Ash | 34,894 | -- | 8,915 | 5,294 | 5,293 | 1,818 | -- | 13,574 | -- | -- | -- |
| Cottonwood | 83,646 | -- | 4,365 | 2,965 | 6,724 | 4,939 | 7,033 | 13,539 | 7,665 | 36,416 | -- |
| Basswood | 807 | -- | 807 | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 9,199 | -- | 477 | 2,517 | 2,631 | 3,574 | -- | -- | -- | -- | -- |
| Black walnut | 8,669 | -- | 1,978 | 4,448 | -- | 2,243 | -- | -- | -- | -- | -- |
| Willow | 6,433 | -- | 2,234 | 372 | -- | 373 | -- | 3,454 | -- | -- | -- |
| Boxelder | 5,125 | -- | 1,129 | 570 | 907 | 2,519 | -- | -- | -- | -- | -- |
| Hackberry | 41,472 | -- | 7,354 | 6,112 | 3,107 | 3,468 | 7,899 | -- | 13,158 | 374 | -- |
| Sycamore | 14,422 | -- | -- | -- | 1,082 | -- | -- | 4,818 | -- | 8,522 | -- |
| Other hardwoods | 23,399 | -- | 1,667 | 3,056 | 1,252 | 4,420 | 4,579 | -- | -- | 8,425 | -- |
| Total | 298,837 | -- | 34,382 | 30,389 | 22,090 | 26,278 | 19,511 | 42,584 | 69,866 | 53,737 | -- |
| All species | 300,057 | 1,220 | 34,382 | 30,389 | 22,090 | 26,278 | 19,511 | 42,584 | 69,866 | 53,737 | -- |

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[1] International 1/4-inch rule.

Table 65.--Net volume of short-log trees on wooded strips by species group and diameter class, Kansas, 1981

(In thousand board feet)[1/]

| Species group | All classes | Diameter class (inches at breast height) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 9.0-10.9 | 11.0-12.9 | 13.0-14.9 | 15.0-16.9 | 17.0-18.9 | 19.0-20.9 | 21.0-22.9 | 23.0-28.9 | 29.0-38.9 | 39.0+ |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other red oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Pecan | 398 | -- | -- | 398 | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Ash | 4,462 | -- | 680 | -- | 2,248 | 643 | -- | 891 | -- | -- | -- |
| Cottonwood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Basswood | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 1,673 | -- | 343 | 691 | 539 | -- | -- | -- | -- | -- | -- |
| Black walnut | 991 | -- | -- | 313 | 678 | -- | -- | -- | -- | -- | -- |
| Willow | 386 | -- | 386 | -- | -- | -- | -- | -- | -- | -- | -- |
| Boxelder | 3,196 | -- | 1,246 | 280 | 757 | 913 | -- | -- | -- | -- | -- |
| Hackberry | 874 | -- | 325 | -- | 549 | -- | -- | -- | -- | -- | -- |
| Sycamore | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hardwoods | 3,424 | -- | 1,271 | 421 | 759 | -- | -- | -- | 973 | -- | -- |
| Total | 15,404 | -- | 4,251 | 2,103 | 5,630 | 1,556 | -- | 891 | 973 | -- | -- |
| All species | 15,404 | -- | 4,251 | 2,103 | 5,630 | 1,556 | -- | 891 | 973 | -- | -- |

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[1/] International 1/4-inch rule.

Table 66.--Net volume of growing stock on wooded strips by species group and forest type, Kansas, 1981

(In thousand cubic feet)

| Species | All types | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 1,077 | 1,058 | -- | -- | -- | -- | -- | -- | -- | -- | 19 |
| Total | 1,077 | 1,058 | -- | -- | -- | -- | -- | -- | -- | -- | 19 |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 11,302 | -- | 231 | -- | -- | 10,433 | -- | -- | -- | 638 | -- |
| Select white oak | 258 | -- | 258 | -- | -- | -- | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oak | 1,658 | -- | 305 | -- | 250 | 887 | -- | -- | -- | -- | 216 |
| Other red oak | 874 | -- | 414 | -- | -- | 460 | -- | -- | -- | -- | -- |
| Select hickory | 177 | -- | -- | -- | -- | 13 | -- | -- | 147 | 17 | -- |
| Other hickory | 733 | -- | 384 | -- | -- | 285 | -- | -- | 64 | -- | -- |
| Pecan | 798 | -- | -- | -- | -- | 798 | -- | -- | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 2,953 | -- | -- | -- | -- | 2,905 | -- | -- | -- | -- | 48 |
| Ash | 11,081 | 1,814 | -- | -- | -- | 5,848 | -- | -- | 949 | 1,434 | 36 |
| Cottonwood | 24,032 | 14,009 | -- | -- | -- | 2,279 | 3,676 | 997 | -- | 1,583 | 1,488 |
| Basswood | 344 | -- | -- | -- | 344 | -- | -- | -- | -- | -- | -- |
| Elm | 5,154 | -- | 72 | -- | 274 | 2,266 | -- | -- | 583 | 1,868 | 91 |
| Black walnut | 3,367 | -- | 117 | -- | 85 | 403 | -- | -- | 2,694 | -- | 68 |
| Willow | 1,474 | -- | -- | -- | 43 | 131 | -- | 168 | -- | 136 | 996 |
| Boxelder | 2,175 | -- | -- | -- | -- | 1,341 | -- | -- | 834 | -- | -- |
| Hackberry | 12,709 | -- | 381 | -- | 287 | 6,461 | -- | 155 | 4,673 | 752 | -- |
| Sycamore | 4,657 | -- | -- | -- | -- | -- | -- | -- | 1,322 | 3,335 | -- |
| Other hardwoods | 6,720 | -- | 147 | -- | 545 | 647 | -- | 16 | 1,386 | 3,943 | 36 |
| Total | 90,466 | 15,823 | 2,309 | -- | 1,828 | 36,157 | 3,676 | 1,336 | 12,652 | 13,706 | 2,979 |
| All species | 91,543 | 16,881 | 2,309 | -- | 1,828 | 36,157 | 3,676 | 1,336 | 12,652 | 13,706 | 2,998 |

Table 67.--Net volume of sawtimber on wooded strips by species group and forest type, Kansas, 1981

(In thousand board feet)[1]

| Species | All types | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 1,220 | 1,220 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total | 1,220 | 1,220 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 48,099 | -- | 741 | -- | -- | 44,480 | -- | -- | -- | 2,878 | -- |
| Select white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Select red oak | 4,633 | -- | -- | -- | -- | 3,531 | -- | -- | -- | -- | 1,102 |
| Other red oak | 3,536 | -- | 1,329 | -- | -- | 2,207 | -- | -- | -- | -- | -- |
| Select hickory | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Other hickory | 959 | -- | -- | -- | -- | 959 | -- | -- | -- | -- | -- |
| Pecan | 2,860 | -- | -- | -- | -- | 2,860 | -- | -- | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 10,684 | -- | -- | -- | -- | 10,684 | -- | -- | -- | -- | -- |
| Ash | 34,894 | 8,180 | -- | -- | -- | 19,701 | -- | -- | 3,413 | 3,600 | -- |
| Cottonwood | 83,646 | 41,355 | -- | -- | -- | 7,182 | 16,629 | 4,187 | -- | 7,260 | 7,033 |
| Basswood | 807 | -- | -- | -- | 807 | -- | -- | -- | -- | -- | -- |
| Elm | 9,199 | -- | -- | -- | 477 | 2,631 | -- | -- | 1,297 | 4,794 | -- |
| Black walnut | 8,669 | -- | -- | -- | -- | 847 | -- | -- | 7,367 | -- | 455 |
| Willow | 6,433 | -- | -- | -- | -- | 623 | -- | 745 | -- | 484 | 4,581 |
| Boxelder | 5,125 | -- | -- | -- | -- | 2,008 | -- | -- | 3,117 | -- | -- |
| Hackberry | 41,472 | -- | 1,037 | -- | -- | 24,172 | -- | 374 | 12,556 | 3,333 | -- |
| Sycamore | 14,422 | -- | -- | -- | -- | -- | -- | -- | 5,900 | 8,522 | -- |
| Other hardwoods | 23,399 | -- | 413 | -- | 2,093 | 1,252 | -- | -- | 3,991 | 15,650 | -- |
| Total | 298,837 | 49,535 | 3,520 | -- | 3,377 | 123,137 | 16,629 | 5,306 | 37,641 | 46,521 | 13,171 |
| All species | 300,057 | 50,755 | 3,520 | -- | 3,377 | 123,137 | 16,629 | 5,306 | 37,641 | 46,521 | 13,171 |

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[1] International 1/4-inch rule.

Table 68.--Net annual growth of growing stock on commercial forest land by softwoods and hardwoods, Kansas, 1964 and 1980

(In thousand cubic feet)

| Species | 1964[1] | 1980 |
|---|---|---|
| Softwoods | -- | 471 |
| Hardwoods | 22,100 | 22,759 |
| All species | 22,100 | 23,230 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1980 volumes because of changes in survey definitions and procedures.

Table 69.--Net annual growth of growing stock on commercial forest land by species group and Forest Survey Unit, Kansas, 1980

(In thousand cubic feet)

| | | Forest Survey Unit | | |
|---|---|---|---|---|
| Species group | All Units | North-eastern Unit | South-eastern Unit | Western Unit |
| SOFTWOODS | | | | |
| Eastern redcedar | 471 | 271 | 197 | 3 |
| Total | 471 | 271 | 197 | 3 |
| HARDWOODS | | | | |
| Bur oak | 1,251 | 576 | 433 | 242 |
| Select white oak | 779 | 485 | 294 | -- |
| Other white oak | 594 | 43 | 551 | -- |
| Select red oak | 1,467 | 674 | 793 | -- |
| Other red oak | 611 | 282 | 329 | -- |
| Select hickory | 467 | 341 | 126 | -- |
| Other hickory | 470 | 341 | 129 | -- |
| Pecan | 254 | 4 | 247 | 3 |
| Hard maple | 94 | 58 | 36 | -- |
| Soft maple | 941 | 423 | 518 | -- |
| Ash | 1,958 | 403 | 892 | 663 |
| Cottonwood | 2,525 | 1,023 | 179 | 1,323 |
| Basswood | 199 | 166 | 33 | -- |
| Elm | 678 | 224 | 538 | -84 |
| Black walnut | 2,167 | 926 | 1,010 | 231 |
| Willow | 382 | 138 | 131 | 113 |
| Boxelder | 762 | 226 | 68 | 468 |
| Hackberry | 4,454 | 1,755 | 2,184 | 515 |
| Sycamore | 590 | 268 | 314 | 8 |
| Other hardwoods | 2,116 | 1,032 | 708 | 376 |
| Total | 22,759 | 9,388 | 9,513 | 3,858 |
| All species | 23,230 | 9,659 | 9,710 | 3,861 |

Table 70.--Net annual growth of sawtimber on commercial forest land by species group and Forest Survey Unit, Kansas, 1980

(In thousand board feet)[1]

| Species group | All Units | Forest Survey Unit: North-eastern Unit | South-eastern Unit | Western Unit |
|---|---|---|---|---|
| SOFTWOODS | | | | |
| Eastern redcedar | 90 | 95 | -5 | -- |
| Total | 90 | 95 | -5 | -- |
| HARDWOODS | | | | |
| Bur oak | 4,255 | 1,738 | 1,408 | 1,109 |
| Select white oak | 2,041 | 1,772 | 269 | -- |
| Other white oak | 460 | 102 | 358 | -- |
| Select red oak | 7,275 | 3,977 | 3,298 | -- |
| Other red oak | 1,179 | 902 | 277 | -- |
| Select hickory | 953 | 796 | 157 | -- |
| Other hickory | 1,060 | 479 | 581 | -- |
| Pecan | 1,113 | 1 | 1,103 | 9 |
| Hard maple | 607 | 66 | 541 | -- |
| Soft maple | 3,170 | 1,462 | 1,708 | -- |
| Ash | 4,768 | 870 | 3,299 | 599 |
| Cottonwood | 8,773 | 2,432 | 1,003 | 5,338 |
| Basswood | 360 | 354 | 6 | -- |
| Elm | -2,234 | -2,142 | 763 | -855 |
| Black walnut | 5,911 | 2,892 | 2,994 | 25 |
| Willow | 2,742 | 1,860 | 444 | 438 |
| Boxelder | 1,642 | 728 | 476 | 438 |
| Hackberry | 13,246 | 5,463 | 6,444 | 1,339 |
| Sycamore | 2,403 | 892 | 1,482 | 29 |
| Other hardwoods | 4,223 | 2,782 | 984 | 457 |
| Total | 63,947 | 27,426 | 27,595 | 8,926 |
| All species | 64,037 | 27,521 | 27,590 | 8,926 |

[1] International 1/4-inch rule.

Table 71.--Net annual growth of growing stock on commercial forest land by species group and ownership class, Kansas, 1980

(In thousand cubic feet)

| Species group | All classes | Ownership class: National forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | |
| Eastern redcedar | 471 | -- | 2 | -- | -- | -- | 325 | 144 |
| Total | 471 | -- | 2 | -- | -- | -- | 325 | 144 |
| HARDWOODS | | | | | | | | |
| Bur oak | 1,251 | -- | 164 | -- | 4 | -- | 715 | 368 |
| Select white oak | 779 | -- | 15 | -- | -- | 7 | 314 | 443 |
| Other white oak | 594 | -- | 18 | -- | -- | -- | 432 | 144 |
| Select red oak | 1,467 | -- | 27 | -- | -- | -- | 891 | 549 |
| Other red oak | 611 | -- | 6 | -- | 22 | -- | 270 | 313 |
| Select hickory | 467 | -- | 13 | -- | 4 | -- | 252 | 198 |
| Other hickory | 470 | -- | 8 | -- | -- | -- | 309 | 153 |
| Pecan | 254 | -- | -- | -- | 2 | -- | 113 | 139 |
| Hard maple | 94 | -- | -- | -- | -- | -- | 29 | 65 |
| Soft maple | 941 | -- | 22 | -- | 75 | 42 | 567 | 235 |
| Ash | 1,958 | -- | 40 | -- | 25 | -- | 1,347 | 546 |
| Cottonwood | 2,525 | -- | 276 | 2 | 159 | -- | 1,656 | 432 |
| Basswood | 199 | -- | 2 | -- | -- | -- | 125 | 72 |
| Elm | 678 | -- | 52 | 3 | 5 | 2 | 519 | 97 |
| Black walnut | 2,167 | -- | 50 | -- | 2 | -- | 1,162 | 953 |
| Willow | 382 | -- | 2 | -- | 4 | 23 | 248 | 105 |
| Boxelder | 762 | -- | -- | -- | -- | 10 | 475 | 277 |
| Hackberry | 4,454 | -- | 203 | 7 | 2 | 54 | 2,828 | 1,360 |
| Sycamore | 590 | -- | 42 | -- | -- | -- | 447 | 101 |
| Other hardwoods | 2,116 | -- | 78 | 13 | 12 | 14 | 1,336 | 663 |
| Total | 22,759 | -- | 1,018 | 25 | 316 | 152 | 14,035 | 7,213 |
| All species | 23,230 | -- | 1,020 | 25 | 316 | 152 | 14,360 | 7,357 |

## Table 72.--Net annual growth of sawtimber on commercial forest land by species group and ownership class, Kansas, 1980

(In thousand board feet)[1]

| Species group | All classes | Ownership class | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | National forest | Misc. federal | Indian | State | County and municipal | Farmer | Misc. private |
| SOFTWOODS | | | | | | | | |
| Eastern redcedar | 90 | -- | -- | -- | -- | -- | 70 | 20 |
| Total | 90 | -- | — | -- | -- | -- | 70 | 20 |
| HARDWOODS | | | | | | | | |
| Bur oak | 4,255 | -- | 104 | -- | 11 | -- | 2,954 | 1,186 |
| Select white oak | 2,041 | -- | 30 | -- | -- | -- | 1,395 | 616 |
| Other white oak | 460 | -- | 39 | -- | -- | -- | 355 | 66 |
| Select red oak | 7,275 | -- | 627 | -- | -- | -- | 2,689 | 3,959 |
| Other red oak | 1,179 | -- | -- | -- | 116 | -- | 158 | 905 |
| Select hickory | 953 | -- | 3 | -- | 8 | -- | 305 | 637 |
| Other hickory | 1,060 | -- | -- | -- | -- | -- | 93 | 967 |
| Pecan | 1,113 | -- | -- | -- | 6 | -- | 807 | 300 |
| Hard maple | 607 | -- | -- | -- | -- | -- | 308 | 299 |
| Soft maple | 3,170 | -- | 95 | -- | 250 | 237 | 1,177 | 1,411 |
| Ash | 4,768 | -- | 112 | -- | 420 | -- | 3,323 | 913 |
| Cottonwood | 8,773 | — | 843 | 2 | -- | -- | 6,435 | 1,493 |
| Basswood | 360 | -- | 9 | -- | -- | -- | 240 | 111 |
| Elm | -2,234 | -- | -14 | -- | -- | 7 | -1,392 | -835 |
| Black walnut | 5,911 | -- | 211 | -- | 13 | -- | 3,560 | 2,127 |
| Willow | 2,742 | -- | -- | -- | -- | 187 | 2,155 | 400 |
| Boxelder | 1,642 | -- | -- | -- | -- | 367 | 685 | 590 |
| Hackberry | 13,246 | -- | 340 | 13 | 9 | 120 | 8,437 | 4,327 |
| Sycamore | 2,403 | -- | 148 | -- | -- | -- | 1,938 | 317 |
| Other hardwoods | 4,223 | -- | 111 | 44 | 33 | 70 | 2,131 | 1,834 |
| Total | 63,947 | -- | 2,658 | 59 | 866 | 988 | 37,753 | 21,623 |
| All species | 64,037 | -- | 2,658 | 59 | 866 | 988 | 37,823 | 21,643 |

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[1] International 1/4-inch rule.

Table 73.--Net annual growth of growing stock on commercial forest land by species group and forest type, Kansas, 1980

(In thousand cubic feet)

| | | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Species | All types | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 471 | 170 | 22 | -- | 23 | 2 | -- | -- | 102 | 146 | 6 |
| Total | 471 | 170 | 22 | -- | 23 | 2 | -- | -- | 102 | 146 | 6 |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 1,251 | 2 | 430 | 8 | 163 | 65 | -- | -- | 574 | 8 | 1 |
| Select white oak | 779 | -23 | 632 | 1 | 17 | 122 | -- | -- | 21 | 9 | -- |
| Other white oak | 594 | 3 | 111 | 470 | 9 | -- | -- | -- | -- | 1 | -- |
| Select red oak | 1,467 | 2 | 1,205 | 24 | 68 | 43 | -- | -- | 89 | 36 | -- |
| Other red oak | 611 | -- | 457 | 83 | 6 | -24 | 63 | -- | 13 | 13 | -- |
| Select hickory | 467 | 2 | 389 | -15 | 7 | 36 | -- | -- | 32 | 16 | -- |
| Other hickory | 470 | -- | 329 | 7 | 27 | 25 | -- | -- | 78 | 4 | -- |
| Pecan | 254 | -- | 183 | -- | 15 | 42 | -- | -- | 3 | 11 | -- |
| Hard maple | 94 | -- | 37 | -- | -- | 31 | -- | -- | 11 | 15 | -- |
| Soft maple | 941 | -- | 11 | -- | -- | 754 | 2 | -- | 167 | 7 | -- |
| Ash | 1,958 | -- | 152 | -- | 18 | 1,260 | 105 | 9 | 268 | 142 | 4 |
| Cottonwood | 2,525 | -- | 39 | -- | 7 | 261 | 2,054 | 12 | 100 | 16 | 36 |
| Basswood | 199 | -- | 55 | -- | 55 | 6 | 4 | -- | 65 | 14 | -- |
| Elm | 678 | 2 | 205 | -- | 160 | 467 | 46 | -- | -369 | 160 | 7 |
| Black walnut | 2,167 | 21 | 369 | 3 | 293 | 272 | 24 | -- | 1,117 | 65 | 3 |
| Willow | 382 | -- | 5 | -- | 3 | 334 | -3 | 24 | 9 | 5 | 5 |
| Boxelder | 762 | -- | 7 | -- | 10 | 594 | 23 | -- | 122 | 4 | 2 |
| Hackberry | 4,454 | 2 | 312 | 1 | 355 | 763 | 13 | -- | 2,939 | 46 | 23 |
| Sycamore | 590 | -- | 60 | -8 | 10 | 223 | 10 | -- | 277 | 16 | 2 |
| Other hardwoods | 2,116 | 2 | 201 | 3 | 71 | 834 | 18 | -- | 660 | 304 | 23 |
| Total | 22,759 | 13 | 5,189 | 577 | 1,294 | 6,108 | 2,359 | 45 | 6,176 | 892 | 106 |
| All species | 23,230 | 183 | 5,211 | 577 | 1,317 | 6,110 | 2,359 | 45 | 6,278 | 1,038 | 112 |

Table 74.--Net annual growth of sawtimber on commercial forest land by species group and forest type, Kansas, 1980

(In thousand board feet)[1]

| Species | All types | Forest type: Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 90 | 5 | 33 | -- | -- | -- | -- | -- | -- | 46 | 6 |
| Total | 90 | 5 | 33 | -- | -- | -- | -- | -- | -- | 46 | 6 |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 4,255 | 6 | 1,675 | -- | 179 | 312 | -- | -- | 2,055 | 28 | -- |
| Select white oak | 2,041 | 53 | 1,797 | 6 | 25 | 50 | -- | -- | 81 | 29 | -- |
| Other white oak | 460 | 3 | 232 | 186 | 36 | -- | -- | -- | -- | 3 | -- |
| Select red oak | 7,275 | -- | 5,431 | 40 | 71 | 207 | -- | -- | 1,440 | 86 | -- |
| Other red oak | 1,179 | -- | 1,193 | 83 | 15 | -200 | -- | -- | 46 | 42 | -- |
| Select hickory | 953 | -- | 412 | 2 | 23 | 106 | -- | -- | 392 | 18 | -- |
| Other hickory | 1,060 | -- | 568 | -- | -- | 40 | -- | -- | 449 | 3 | -- |
| Pecan | 1,113 | -- | 887 | -- | -- | 187 | -- | -- | 9 | 30 | -- |
| Hard maple | 607 | -- | 538 | -- | -- | 47 | -- | -- | -- | 22 | -- |
| Soft maple | 3,170 | -- | 219 | -- | -- | 1,945 | 13 | -- | 982 | 11 | -- |
| Ash | 4,768 | -- | 296 | -- | 29 | 3,035 | 47 | 14 | 1,309 | 27 | 11 |
| Cottonwood | 8,773 | -- | 125 | -- | 24 | 456 | 7,600 | 60 | 350 | 51 | 107 |
| Basswood | 360 | -- | 170 | -- | 86 | 32 | -- | -- | 14 | 58 | -- |
| Elm | -2,234 | 1 | -126 | -- | 81 | -419 | 18 | -- | -1,964 | 160 | 15 |
| Black walnut | 5,911 | 31 | 679 | -- | 391 | 1,040 | 396 | -- | 3,226 | 148 | -- |
| Willow | 2,742 | -- | -1 | -- | -- | 2,493 | 106 | 80 | 23 | 13 | 28 |
| Boxelder | 1,642 | -- | 9 | -- | 367 | 921 | 38 | -- | 307 | -- | -- |
| Hackberry | 13,246 | -- | 620 | 6 | 1,336 | 2,295 | 92 | -- | 8,774 | 59 | 64 |
| Sycamore | 2,403 | -- | 489 | -- | 36 | 558 | 27 | -- | 1,219 | 66 | 8 |
| Other hardwoods | 4,223 | -- | 421 | 5 | 107 | 1,660 | 12 | -- | 1,087 | 914 | 17 |
| Total | 63,947 | 94 | 15,634 | 328 | 2,806 | 14,765 | 8,349 | 154 | 19,799 | 1,768 | 250 |
| All species | 64,037 | 99 | 15,667 | 328 | 2,806 | 14,765 | 8,349 | 154 | 19,799 | 1,814 | 256 |

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[1] International 1/4-inch rule.

Table 75.--Net annual growth of growing stock on commercial forest land by forest type and stand-age class, Kansas, 1980

(In thousand cubic feet)

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Eastern redcedar-hardwood | 183 | 38 | 70 | -- | -25 | -- | 64 | -- | -- | -- | -- | -- | 36 | -- |
| Oak-hickory | 5,211 | 54 | 140 | 406 | 576 | 621 | 711 | 815 | 789 | 300 | 439 | 236 | 109 | 15 |
| Post-blackjack oak | 577 | 3 | 2 | -1 | 101 | 362 | 10 | 6 | 7 | 48 | -- | 39 | -- | -- |
| Upland plains hardwoods | 1,317 | 33 | 178 | 266 | 220 | 144 | 222 | 164 | 23 | 26 | -- | 7 | 34 | -- |
| Elm-ash-cottonwood | 6,110 | 121 | 594 | 215 | 672 | 291 | 1,466 | 1,109 | 952 | 183 | 191 | 316 | -- | -- |
| Cottonwood | 2,359 | 6 | 2 | 119 | 176 | 191 | 305 | 714 | 241 | 129 | 315 | 161 | -- | -- |
| Willow | 45 | 2 | 29 | 10 | -- | -- | 4 | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 6,278 | 91 | 384 | 181 | 555 | 227 | 1,142 | 1,555 | 1,180 | 469 | 319 | 119 | 10 | 46 |
| Upland elm-ash-locust | 1,038 | 165 | 193 | 139 | 215 | 16 | 42 | 42 | 123 | 40 | 38 | -- | 25 | -- |
| Nonstocked | 112 | 15 | 7 | 25 | 13 | -- | 40 | 5 | 6 | 1 | -- | -- | -- | -- |
| All types | 23,230 | 528 | 1,599 | 1,360 | 2,503 | 1,852 | 4,006 | 4,410 | 3,321 | 1,196 | 1,302 | 878 | 214 | 61 |

Table 76.--Net annual growth of sawtimber on commercial forest land by forest type and stand-age class, Kansas, 1980

(In thousand board feet)[1]

| Forest type | All classes | Stand-age class (years) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-140 | 141+ |
| Eastern redcedar-hardwood | 99 | 48 | 16 | -- | 16 | -- | -57 | -- | -- | -- | -- | -- | 76 | -- |
| Oak-hickory | 15,667 | 521 | 8 | 946 | 1,855 | 1,237 | 1,988 | 2,049 | 2,556 | 1,236 | 2,194 | 743 | 288 | 46 |
| Post-blackjack oak | 328 | 7 | -- | -- | 11 | 113 | 14 | 9 | -19 | 112 | -- | 81 | -- | -- |
| Upland plains hardwoods | 2,806 | 23 | 165 | 124 | 929 | 87 | 390 | 868 | 73 | 64 | -- | 20 | 63 | -- |
| Elm-ash-cottonwood | 14,765 | 209 | 502 | 709 | 460 | 1,558 | 4,620 | 3,588 | 1,698 | 126 | 927 | 368 | -- | -- |
| Cottonwood | 8,349 | -- | 8 | 320 | -16 | 440 | 1,675 | 2,911 | 1,204 | 371 | 954 | 482 | -- | -- |
| Willow | 154 | 8 | 113 | 11 | -- | -- | 22 | -- | -- | -- | -- | -- | -- | -- |
| Lowland plains hardwoods | 19,799 | 273 | 357 | 569 | 1,912 | 1,095 | 3,821 | 5,380 | 3,377 | 1,552 | 853 | 493 | 30 | 87 |
| Upland elm-ash-locust | 1,814 | 202 | 216 | 274 | 180 | 26 | 481 | 97 | 70 | 110 | 99 | -- | 59 | -- |
| Nonstocked | 256 | 76 | 13 | -- | 17 | -- | 105 | 28 | 14 | 3 | -- | -- | -- | -- |
| All types | 64,037 | 1,367 | 1,398 | 2,953 | 5,364 | 4,556 | 13,059 | 14,930 | 8,973 | 3,574 | 5,027 | 2,187 | 516 | 133 |

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[1] International 1/4-inch rule.

## Table 77.--Net annual growth of growing stock on commercial forest land by forest type, stand-size class, and basal-area class, Kansas, 1980

(In thousand cubic feet)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Eastern redcedar-hardwood | | | | | | | | | | | | | | | |
| Sawtimber | 82 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 82 | -- | -- | -- |
| Poletimber | -7 | -- | -- | -- | -- | -- | -- | -25 | 18 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 108 | -- | 7 | 9 | 6 | 20 | 66 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 183 | -- | 7 | 9 | 6 | 20 | 66 | -25 | 18 | -- | -- | 82 | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 2,831 | -- | -- | 36 | 16 | 188 | 223 | 284 | 265 | 810 | 230 | 640 | 139 | -- | -- |
| Poletimber | 2,005 | -- | -- | -- | -1 | 36 | 176 | 271 | 414 | 257 | 84 | 627 | 141 | -- | -- |
| Sapling & seedling | 375 | -37 | -1 | 101 | 8 | 214 | 39 | 22 | 1 | 25 | 3 | -- | -- | -- | -- |
| All stands | 5,211 | -37 | -1 | 137 | 23 | 438 | 438 | 577 | 680 | 1,092 | 317 | 1,267 | 280 | -- | -- |
| Post-blackjack oak | | | | | | | | | | | | | | | |
| Sawtimber | 79 | -- | -- | -20 | -- | -- | 15 | 6 | 47 | 31 | -- | -- | -- | -- | -- |
| Poletimber | 438 | -- | -- | -- | -- | -- | -- | -- | 35 | 83 | 91 | 210 | 19 | -- | -- |
| Sapling & seedling | 60 | -- | -- | 2 | -- | -- | 3 | 3 | -- | -- | 52 | -- | -- | -- | -- |
| All stands | 577 | -- | -- | -18 | -- | -- | 18 | 9 | 82 | 114 | 143 | 210 | 19 | -- | -- |
| Upland plains hardwoods | | | | | | | | | | | | | | | |
| Sawtimber | 466 | -- | -- | -- | 16 | 30 | 27 | 31 | 144 | 131 | -- | -- | 87 | -- | -- |
| Poletimber | 721 | -- | -- | 5 | -- | 18 | 143 | 109 | 9 | 119 | 154 | 164 | -- | -- | -- |
| Sapling & seedling | 130 | -- | -- | 12 | 9 | 25 | -- | 63 | 6 | 15 | -- | -- | -- | -- | -- |
| All stands | 1,317 | -- | -- | 17 | 25 | 73 | 170 | 203 | 159 | 265 | 154 | 164 | 87 | -- | -- |
| Elm-ash-cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 4,270 | -- | -- | 50 | 71 | 251 | 184 | 330 | 696 | 245 | 479 | 490 | 924 | 550 | -- |
| Poletimber | 1,072 | -- | -- | -4 | -- | 42 | 147 | 112 | 61 | 114 | 13 | 587 | -- | -- | -- |
| Sapling & seedling | 768 | -24 | 7 | 93 | 145 | 401 | 97 | -71 | 85 | 7 | 28 | -- | -- | -- | -- |
| All stands | 6,110 | -24 | 7 | 139 | 216 | 694 | 428 | 371 | 842 | 366 | 520 | 1,077 | 924 | 550 | -- |
| Cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 2,060 | -- | 4 | 13 | -- | 61 | 104 | -- | 305 | 163 | 161 | 483 | 289 | 269 | 208 |
| Poletimber | 261 | -- | -- | -- | -- | -- | 89 | -- | 9 | -- | 163 | -- | -- | -- | -- |
| Sapling & seedling | 38 | -- | 2 | -- | 6 | -- | -- | -- | -- | 30 | -- | -- | -- | -- | -- |
| All stands | 2,359 | -- | 6 | 13 | 6 | 61 | 193 | -- | 314 | 193 | 324 | 483 | 289 | 269 | 208 |

(Table 77 continued on next page)

(Table 77 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Willow | | | | | | | | | | | | | | |
| Sawtimber | 4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4 | -- | -- | -- |
| Poletimber | 10 | -- | -- | 10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 31 | 2 | -- | -- | -- | -- | 29 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 45 | 2 | -- | 10 | -- | -- | 29 | -- | -- | -- | -- | 4 | -- | -- | -- |
| Lowland plains hardwoods | | | | | | | | | | | | | | |
| Sawtimber | 4,759 | -- | -- | 12 | 62 | 208 | 632 | 364 | 658 | 825 | 492 | 1,221 | 285 | -- | -- |
| Poletimber | 1,138 | -- | 18 | 24 | -- | -- | 111 | 80 | 181 | 115 | 87 | 522 | -- | -- | -- |
| Sapling & seedling | 381 | -- | 10 | 8 | 61 | 196 | 49 | 19 | 38 | -- | -- | -- | -- | -- | -- |
| All stands | 6,278 | -- | 28 | 44 | 123 | 404 | 792 | 463 | 877 | 940 | 579 | 1,743 | 285 | -- | -- |
| Upland elm-ash-locust | | | | | | | | | | | | | | |
| Sawtimber | 272 | -- | -- | 3 | 4 | 7 | 64 | 47 | 50 | 70 | 27 | -- | -- | -- | -- |
| Poletimber | 388 | -- | -- | -- | 9 | -- | 27 | 135 | 21 | 41 | 26 | 129 | -- | -- | -- |
| Sapling & seedling | 378 | -2 | 95 | 36 | 17 | 94 | 48 | 23 | 46 | 16 | 5 | -- | -- | -- | -- |
| All stands | 1,038 | -2 | 95 | 39 | 30 | 101 | 139 | 205 | 117 | 127 | 58 | 129 | -- | -- | -- |
| Nonstocked | 112 | 2 | 44 | 4 | 15 | 32 | 15 | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | |
| Sawtimber | 14,823 | -- | 4 | 94 | 169 | 745 | 1,249 | 1,062 | 2,165 | 2,275 | 1,389 | 2,920 | 1,724 | 819 | 208 |
| Poletimber | 6,026 | -- | 18 | 35 | 8 | 96 | 693 | 682 | 748 | 729 | 618 | 2,239 | 160 | -- | -- |
| Sapling & seedling | 2,269 | -61 | 120 | 261 | 252 | 950 | 331 | 59 | 176 | 93 | 88 | -- | -- | -- | -- |
| Nonstocked | 112 | 2 | 44 | 4 | 15 | 32 | 15 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 23,230 | -59 | 186 | 394 | 444 | 1,823 | 2,288 | 1,803 | 3,089 | 3,097 | 2,095 | 5,159 | 1,884 | 819 | 208 |

Table 78.--Net annual growth of sawtimber on commercial forest land by forest type, stand-size class, and basal-area class, Kansas, 1980

(In thousand board feet)[1]

| Forest type and | All | Basal-area class (square feet per acre) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| stand-size class | classes | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Eastern redcedar-hardwood | | | | | | | | | | | | | | | |
| Sawtimber | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Poletimber | 35 | -- | -- | -- | -- | -- | -- | 16 | 19 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 64 | -- | -- | 17 | 10 | 30 | 7 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 99 | -- | -- | 17 | 10 | 30 | 7 | 16 | 19 | -- | -- | -- | -- | -- | -- |
| Oak-hickory | | | | | | | | | | | | | | | |
| Sawtimber | 11,265 | -- | -- | -- | 66 | 1,329 | 1,180 | 1,191 | 1,273 | 2,974 | 664 | 2,162 | 426 | -- | -- |
| Poletimber | 3,840 | -- | -- | -- | -- | 29 | 253 | 253 | 515 | 857 | 159 | 1,643 | 131 | -- | -- |
| Sapling & seedling | 562 | -204 | -3 | 74 | -165 | 765 | 85 | 50 | -75 | 27 | 8 | -- | -- | -- | -- |
| All stands | 15,667 | -204 | -3 | 74 | -99 | 2,123 | 1,518 | 1,494 | 1,713 | 3,858 | 831 | 3,805 | 557 | -- | -- |
| Post-blackjack oak | | | | | | | | | | | | | | | |
| Sawtimber | 153 | -- | -- | -60 | -- | -- | 26 | 11 | 97 | 79 | -- | -- | -- | -- | -- |
| Poletimber | 164 | -- | -- | -- | -- | -- | -- | -- | 31 | 41 | 78 | 14 | -- | -- | -- |
| Sapling & seedling | 11 | -- | -- | -- | -- | -- | 4 | 7 | -- | -- | -- | -- | -- | -- | -- |
| All stands | 328 | -- | -- | -60 | -- | -- | 30 | 18 | 128 | 120 | 78 | 14 | -- | -- | -- |
| Upland plains hardwoods | | | | | | | | | | | | | | | |
| Sawtimber | 1,439 | -- | -- | -- | 102 | 95 | 52 | 81 | 201 | 344 | -- | -- | 564 | -- | -- |
| Poletimber | 1,274 | -- | -- | -- | -- | 47 | 60 | 56 | -- | 436 | 106 | 569 | -- | -- | -- |
| Sapling & seedling | 93 | -- | -- | -- | 42 | 19 | -- | -- | 4 | 28 | -- | -- | -- | -- | -- |
| All stands | 2,806 | -- | -- | -- | 144 | 161 | 112 | 137 | 205 | 808 | 106 | 569 | 564 | -- | -- |
| Elm-ash-cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 12,797 | -- | -- | 219 | 334 | 1,398 | 509 | 1,070 | 1,908 | 1,011 | 728 | 1,576 | 2,419 | 1,625 | -- |
| Poletimber | 1,023 | -- | -- | -4 | -- | 42 | 198 | 134 | 97 | 144 | 15 | 397 | -- | -- | -- |
| Sapling & seedling | 945 | -121 | 10 | 246 | 147 | 830 | 197 | -536 | 13 | 30 | 129 | -- | -- | -- | -- |
| All stands | 14,765 | -121 | 10 | 461 | 481 | 2,270 | 904 | 668 | 2,018 | 1,185 | 872 | 1,973 | 2,419 | 1,625 | -- |
| Cottonwood | | | | | | | | | | | | | | | |
| Sawtimber | 8,059 | -- | 22 | 36 | -- | 170 | 352 | -- | 1,704 | 469 | 373 | 1,654 | 1,295 | 1,191 | 793 |
| Poletimber | 273 | -- | -- | -- | -- | -- | 311 | -- | -38 | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 17 | -- | 8 | -- | -- | -- | -- | -- | -- | 9 | -- | -- | -- | -- | -- |
| All stands | 8,349 | -- | 30 | 36 | -- | 170 | 663 | -- | 1,666 | 478 | 373 | 1,654 | 1,295 | 1,191 | 793 |

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[1] International 1/4-inch rule.

(Table 78 continued)

| Forest type and stand-size class | All classes | Basal-area class (square feet per acre) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-120 | 121-150 | 151-180 | 181+ |
| Willow | | | | | | | | | | | | | | |
| Sawtimber | 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 22 | -- | -- | -- |
| Poletimber | 11 | -- | -- | 11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sapling & seedling | 121 | 8 | -- | -- | -- | -- | 113 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 154 | 8 | -- | 11 | -- | -- | 113 | -- | -- | -- | -- | 22 | -- | -- | -- |
| Lowland plains hardwood | | | | | | | | | | | | | | | |
| Sawtimber | 15,423 | -- | -- | 48 | 300 | 693 | 1,596 | 1,236 | 1,600 | 2,178 | 2,072 | 4,594 | 1,106 | -- | -- |
| Poletimber | 3,353 | -- | -- | 19 | -- | -- | 1,123 | 412 | 799 | 444 | 20 | 536 | -- | -- | -- |
| Sapling & seedling | 1,023 | -- | 45 | -6 | 159 | 470 | 149 | 159 | 47 | -- | -- | -- | -- | -- | -- |
| All stands | 19,799 | -- | 45 | 61 | 459 | 1,163 | 2,868 | 1,807 | 2,446 | 2,622 | 2,092 | 5,130 | 1,106 | -- | -- |
| Upland elm-ash-locust | | | | | | | | | | | | | | | |
| Sawtimber | 921 | -- | -- | 8 | 10 | 12 | 30 | 116 | 141 | 537 | 67 | -- | -- | -- | -- |
| Poletimber | 417 | -- | -- | -- | 195 | -- | 53 | 83 | 9 | 3 | 61 | 13 | -- | -- | -- |
| Sapling & seedling | 476 | -- | 65 | 59 | 75 | 135 | 87 | -- | 31 | 11 | 13 | -- | -- | -- | -- |
| All stands | 1,814 | -- | 65 | 67 | 280 | 147 | 170 | 199 | 181 | 551 | 141 | 13 | -- | -- | -- |
| Nonstocked | 256 | -- | 159 | 8 | 34 | 50 | 5 | -- | -- | -- | -- | -- | -- | -- | -- |
| All types | | | | | | | | | | | | | | | |
| Sawtimber | 50,079 | -- | 22 | 251 | 812 | 3,697 | 3,745 | 3,705 | 6,924 | 7,592 | 3,904 | 10,008 | 5,810 | 2,816 | 793 |
| Poletimber | 10,390 | -- | -- | 26 | 195 | 118 | 1,998 | 954 | 1,432 | 1,925 | 439 | 3,172 | 131 | -- | -- |
| Sapling & seedling | 3,312 | -317 | 125 | 390 | 268 | 2,249 | 642 | -320 | 20 | 105 | 150 | -- | -- | -- | -- |
| Nonstocked | 256 | -- | 159 | 8 | 34 | 50 | 5 | -- | -- | -- | -- | -- | -- | -- | -- |
| All stands | 64,037 | -317 | 306 | 675 | 1,309 | 6,114 | 6,390 | 4,339 | 8,376 | 9,622 | 4,493 | 13,180 | 5,941 | 2,816 | 793 |

Table 79.--Net annual growth of growing stock on wooded strips by species group and Forest Survey Unit, Kansas, 1980

(In thousand cubic feet)

| Species group | All Units | Forest Survey Unit<br>North-eastern Unit | <br>South-eastern Unit | <br>Western Unit |
|---|---|---|---|---|
| SOFTWOODS | | | | |
| Eastern redcedar | 107 | 11 | -- | 96 |
| Total | 107 | 11 | -- | 96 |
| HARDWOODS | | | | |
| Bur oak | 157 | 11 | 21 | 125 |
| Select white oak | 41 | -- | 41 | -- |
| Other white oak | -- | -- | -- | -- |
| Select red oak | 45 | 8 | 37 | -- |
| Other red oak | 24 | 9 | 15 | -- |
| Select hickory | 9 | 8 | 1 | -- |
| Other hickory | 22 | 7 | 15 | -- |
| Pecan | 10 | -- | 10 | -- |
| Hard maple | -- | -- | -- | -- |
| Soft maple | 120 | 95 | 25 | -- |
| Ash | 360 | 96 | 70 | 194 |
| Cottonwood | -32 | 92 | -316 | 192 |
| Basswood | 26 | 26 | -- | -- |
| Elm | 199 | 128 | 66 | 5 |
| Black walnut | 107 | 75 | 32 | -- |
| Willow | 34 | 20 | 6 | 8 |
| Boxelder | 99 | 71 | 28 | -- |
| Hackberry | 840 | 201 | 411 | 228 |
| Sycamore | 88 | 53 | 35 | -- |
| Other hardwoods | 196 | 153 | 43 | -- |
| Total | 2,345 | 1,053 | 540 | 752 |
| All species | 2,452 | 1,064 | 540 | 848 |

Table 80.--Net annual growth of sawtimber on wooded strips by species group and Forest Survey Unit, Kansas, 1980

(In thousand board feet)[1]

| Species group | All Units | Forest Survey Unit: North-eastern Unit | South-eastern Unit | Western Unit |
|---|---|---|---|---|
| SOFTWOODS | | | | |
| Eastern redcedar | 53 | -- | -- | 53 |
| Total | 53 | -- | -- | 53 |
| HARDWOODS | | | | |
| Bur oak | 581 | 36 | 81 | 464 |
| Select white oak | -- | -- | -- | -- |
| Other white oak | -- | -- | -- | -- |
| Select red oak | 99 | -- | 99 | -- |
| Other red oak | 78 | 52 | 26 | -- |
| Select hickory | -- | -- | -- | -- |
| Other hickory | 20 | -- | 20 | -- |
| Pecan | 28 | -- | 28 | -- |
| Hard maple | -- | -- | -- | -- |
| Soft maple | 221 | 174 | 47 | -- |
| Ash | 1,272 | 865 | 90 | 317 |
| Cottonwood | 1,806 | 802 | -624 | 1,628 |
| Basswood | 12 | 12 | -- | -- |
| Elm | 154 | 72 | 82 | -- |
| Black walnut | 180 | 137 | 43 | -- |
| Willow | 1,690 | 531 | 27 | 1,132 |
| Boxelder | 159 | 44 | 115 | -- |
| Hackberry | 2,178 | 730 | 1,173 | 275 |
| Sycamore | 186 | 60 | 126 | -- |
| Other hardwoods | 488 | 356 | 132 | -- |
| Total | 9,152 | 3,871 | 1,465 | 3,816 |
| All species | 9,205 | 3,871 | 1,465 | 3,869 |

[1] International 1/4-inch rule.

Table 81.--Timber removals from growing stock on commercial forest land, by species group and Forest Survey Unit, Kansas, 1980

(In thousand cubic feet)

| Species group | All Units | Forest Survey Unit<br>North-eastern Unit | South-eastern Unit | Western Unit |
|---|---|---|---|---|
| SOFTWOODS | | | | |
| Eastern redcedar | 89 | 40 | 14 | 35 |
| Total | 89 | 40 | 14 | 35 |
| HARDWOODS | | | | |
| Bur oak | 1,303 | 604 | 360 | 339 |
| Select white oak | 700 | 434 | 266 | -- |
| Other white oak | 480 | 41 | 439 | -- |
| Select red oak | 1,195 | 573 | 604 | 18 |
| Other red oak | 703 | 341 | 362 | -- |
| Select hickory | 168 | 115 | 53 | -- |
| Other hickory | 106 | 58 | 48 | -- |
| Pecan | 85 | -- | 85 | -- |
| Hard maple | 15 | 3 | 12 | -- |
| Soft maple | 500 | 201 | 297 | 2 |
| Ash | 1,629 | 451 | 888 | 290 |
| Cottonwood | 1,935 | 893 | 559 | 483 |
| Basswood | 17 | 17 | -- | -- |
| Elm | 685 | 280 | 337 | 68 |
| Black walnut | 1,307 | 787 | 508 | 12 |
| Hackberry | 1,220 | 437 | 672 | 111 |
| Sycamore | 320 | 70 | 237 | 13 |
| Other hardwoods[1/] | 1,526 | 694 | 530 | 302 |
| Total | 13,894 | 5,999 | 6,257 | 1,638 |
| All species | 13,983 | 6,039 | 6,271 | 1,673 |

[1/] Includes willow and boxelder species groups.

## Table 82.--Timber removals from sawtimber on commercial forest land, by species group and Forest Survey Unit, Kansas, 1980

(In thousand board feet)[1]

| Species group | All Units | Forest Survey Unit | | |
|---|---|---|---|---|
| | | North-eastern Unit | South-eastern Unit | Western Unit |
| SOFTWOODS | | | | |
| Eastern redcedar | 324 | 132 | 30 | 162 |
| Total | 324 | 132 | 30 | 162 |
| HARDWOODS | | | | |
| Bur oak | 4,771 | 2,002 | 1,721 | 1,048 |
| Select white oak | 1,881 | 1,203 | 678 | -- |
| Other white oak | 830 | 94 | 736 | -- |
| Select red oak | 3,529 | 1,620 | 1,832 | 77 |
| Other red oak | 2,199 | 1,082 | 1,117 | -- |
| Select hickory | 527 | 344 | 183 | -- |
| Other hickory | 257 | 157 | 100 | -- |
| Pecan | 394 | 4 | 389 | 1 |
| Hard maple | 41 | 8 | 33 | -- |
| Soft maple | 2,126 | 699 | 1,422 | 5 |
| Ash | 5,484 | 1,538 | 3,058 | 888 |
| Cottonwood | 9,154 | 4,334 | 3,146 | 1,674 |
| Basswood | 66 | 65 | 1 | -- |
| Elm | 2,538 | 936 | 1,362 | 240 |
| Black walnut | 8,281 | 4,977 | 3,204 | 100 |
| Hackberry | 4,890 | 1,585 | 2,879 | 426 |
| Sycamore | 1,611 | 321 | 1,220 | 70 |
| Other hardwoods[2] | 4,350 | 1,951 | 1,504 | 895 |
| Total | 52,929 | 22,920 | 24,585 | 5,424 |
| All species | 53,253 | 23,052 | 24,615 | 5,586 |

[1] International 1/4-inch rule.

[2] Includes willow and boxelder species groups.

Table 83.--Timber removals[1] from growing stock and sawtimber on commercial forest land by species group, Kansas, 1964 and 1980

| Species group | Growing stock 1964[2] | Growing stock 1980 | Sawtimber 1964[2] | Sawtimber 1980 |
|---|---|---|---|---|
| | Thousand cubic feet | | Thousand board feet[3] | |
| SOFTWOODS | | | | |
| Eastern redcedar | 21 | 89 | -- | 324 |
| Total | 21 | 89 | -- | 324 |
| HARDWOODS | | | | |
| Bur oak | 953 | 1,303 | 3,604 | 4,771 |
| Select white oak | 120 | 700 | 502 | 1,881 |
| Other white oak | 295 | 480 | 493 | 830 |
| Select red oak | 156 | 1,195 | 169 | 3,529 |
| Other red oak | 492 | 703 | 1,455 | 2,199 |
| Select hickory | 330 | 168 | 981 | 527 |
| Other hickory | 209 | 106 | 479 | 257 |
| Pecan | 72 | 85 | 257 | 394 |
| Hard maple | 12 | 15 | 4 | 41 |
| Soft maple | 667 | 500 | 2,732 | 2,126 |
| Ash | 607 | 1,629 | 1,550 | 5,484 |
| Cottonwood | 1,120 | 1,935 | 4,183 | 9,154 |
| Basswood | 19 | 17 | 11 | 66 |
| Elm | 848 | 685 | 2,539 | 2,538 |
| Black walnut | 1,180 | 1,307 | 7,240 | 8,281 |
| Hackberry | 626 | 1,220 | 2,351 | 4,890 |
| Sycamore | 259 | 320 | 903 | 1,611 |
| Other hardwoods[4] | 314 | 1,526 | 547 | 4,350 |
| Total | 8,279 | 13,894 | 30,000 | 52,929 |
| All species | 8,300 | 13,983 | 30,000 | 53,253 |

[1] Removals in 1980 are trend-level removals.

[2] Figures have been adjusted from those published after the 1966 survey to conform to 1980 volumes because of changes in survey definitions and procedures.

[3] International 1/4-inch rule.

[4] Includes willow and boxelder species groups.

Table 84.--Timber removals from growing stock and sawtimber on commercial forest land by item and species category, Kansas, 1980

| | | Species category | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Item | All species | Softwoods | Oak | Elm-hackberry | Ash | Cottonwood | Walnut | Other hardwoods |
| GROWING STOCK | | | | | | | | |
| | -Thousand cubic feet- | | | | | | | |
| ROUNDWOOD PRODUCTS | | | | | | | | |
| Saw logs | 4,340 | 66 | 730 | 638 | 336 | 940 | 1,138 | 492 |
| Veneer logs | 72 | -- | 12 | -- | -- | -- | 60 | -- |
| Cooperage logs | 40 | -- | 40 | -- | -- | -- | -- | -- |
| Fuelwood | 7,577 | -- | 3,184 | 1,033 | 1,034 | 398 | -- | 1,928 |
| Posts | 52 | 18 | 19 | -- | -- | -- | -- | 15 |
| Total | 12,081 | 84 | 3,985 | 1,671 | 1,370 | 1,338 | 1,198 | 2,435 |
| LOGGING RESIDUE | 755 | -- | 231 | 69 | 137 | 140 | 109 | 69 |
| OTHER REMOVALS | 1,147 | 5 | 165 | 165 | 122 | 457 | -- | 233 |
| ALL TIMBER REMOVALS | 13,983 | 89 | 4,381 | 1,905 | 1,629 | 1,935 | 1,307 | 2,737 |
| SAWTIMBER | | | | | | | | |
| | -Thousand board feet[1]- | | | | | | | |
| ROUNDWOOD PRODUCTS | | | | | | | | |
| Saw logs | 26,269 | 312 | 3,358 | 4,017 | 1,991 | 6,107 | 7,431 | 3,053 |
| Veneer logs | 475 | -- | 59 | -- | -- | -- | 416 | -- |
| Cooperage logs | 237 | -- | 237 | -- | -- | -- | -- | -- |
| Fuelwood | 20,895 | -- | 8,773 | 2,850 | 2,851 | 1,097 | -- | 5,324 |
| Posts | 114 | 11 | 62 | -- | -- | -- | -- | 41 |
| Total | 47,990 | 323 | 12,489 | 6,867 | 4,842 | 7,204 | 7,847 | 8,418 |
| LOGGING RESIDUE | 1,637 | -- | 327 | 125 | 315 | 293 | 434 | 143 |
| OTHER REMOVALS | 3,626 | 1 | 394 | 436 | 327 | 1,657 | -- | 811 |
| ALL TIMBER REMOVALS | 53,253 | 324 | 13,210 | 7,428 | 5,484 | 9,154 | 8,281 | 9,372 |

[1] International 1/4-inch rule.

Table 85.--Net annual growth and removals of growing stock on commercial forest land by species group, Kansas, 1980

(In thousand cubic feet)

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| Eastern redcedar | 471 | 89 |
| Total | 471 | 89 |
| HARDWOODS | | |
| Bur oak | 1,251 | 1,303 |
| Select white oak | 779 | 700 |
| Other white oak | 594 | 480 |
| Select red oak | 1,467 | 1,195 |
| Other red oak | 611 | 703 |
| Select hickory | 467 | 168 |
| Other hickory | 470 | 106 |
| Pecan | 254 | 85 |
| Hard maple | 94 | 15 |
| Soft maple | 941 | 500 |
| Ash | 1,958 | 1,629 |
| Cottonwood | 2,525 | 1,935 |
| Basswood | 199 | 17 |
| Elm | 678 | 685 |
| Black walnut | 2,167 | 1,307 |
| Hackberry | 4,454 | 1,220 |
| Sycamore | 590 | 320 |
| Other hardwoods[1] | 3,260 | 1,526 |
| Total | 22,759 | 13,894 |
| All species | 23,230 | 13,983 |

[1] Includes willow and boxelder species groups.

Table 86.--Net annual growth and removals of sawtimber on commercial forest land by species group, Kansas, 1980

(In thousand board feet)[1]

| Species group | Net annual growth | Annual timber removals |
|---|---|---|
| SOFTWOODS | | |
| Eastern redcedar | 90 | 324 |
| Total | 90 | 324 |
| HARDWOODS | | |
| Bur oak | 4,255 | 4,771 |
| Select white oak | 2,041 | 1,881 |
| Other white oak | 460 | 830 |
| Select red oak | 7,275 | 3,529 |
| Other red oak | 1,179 | 2,199 |
| Select hickory | 953 | 527 |
| Other hickory | 1,060 | 257 |
| Pecan | 1,113 | 394 |
| Hard maple | 607 | 41 |
| Soft maple | 3,170 | 2,126 |
| Ash | 4,768 | 5,484 |
| Cottonwood | 8,773 | 9,154 |
| Basswood | 360 | 66 |
| Elm | -2,234 | 2,538 |
| Black walnut | 5,911 | 8,281 |
| Hackberry | 13,246 | 4,890 |
| Sycamore | 2,403 | 1,611 |
| Other hardwoods[2] | 8,607 | 4,350 |
| Total | 63,947 | 52,929 |
| All species | 64,037 | 53,253 |

[1] International 1/4-inch rule.

[2] Includes willow and boxelder species groups.

Table 87.--Net annual growth and removals of growing stock on commercial forest land by ownership class and softwoods and hardwoods, Kansas, 1980

(In thousand cubic feet)

| Ownership class | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| PUBLIC | | | | | | |
| National Forest | -- | -- | -- | -- | -- | -- |
| Misc. federal | 1,020 | 2 | 1,018 | 13 | -- | 13 |
| Indian | 25 | -- | 25 | 6 | -- | 6 |
| State | 316 | -- | 316 | -- | -- | -- |
| County & municipal | 152 | -- | 152 | -- | -- | -- |
| Total | 1,513 | 2 | 1,511 | 19 | -- | 19 |
| PRIVATE | | | | | | |
| Farmer and Misc. private | 21,717 | 469 | 21,248 | 13,964 | 89 | 13,875 |
| All owners | 23,230 | 471 | 22,759 | 13,983 | 89 | 13,894 |

Table 88.--Net annual growth and removals of sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Kansas, 1980

(In thousand board feet)[1]

| Ownership class | Net annual growth | | | Annual timber removals | | |
|---|---|---|---|---|---|---|
| | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
| PUBLIC | | | | | | |
| National Forest | -- | -- | -- | -- | -- | -- |
| Misc. federal | 2,658 | -- | 2,658 | 33 | -- | 33 |
| Indian | 59 | -- | 59 | 17 | -- | 17 |
| State | 866 | -- | 866 | -- | -- | -- |
| County & municipal | 988 | -- | 988 | -- | -- | -- |
| Total | 4,571 | -- | 4,571 | 50 | -- | 50 |
| PRIVATE | | | | | | |
| Farmer and Misc. private | 59,466 | 90 | 59,376 | 53,203 | 324 | 52,879 |
| All owners | 64,037 | 90 | 63,947 | 53,253 | 324 | 52,929 |

[1] International ¼-inch rule.

Table 89.--Annual mortality of growing stock on commercial forest land by softwoods and hardwoods, Kansas, 1964 and 1980

(In thousand cubic feet)

| Species | 1964[1] | 1980 |
|---|---|---|
| Softwoods | -- | 28 |
| Hardwoods | 3,280 | 3,739 |
| All species | 3,280 | 3,767 |

[1] Figures have been adjusted from those published after the 1965 survey to conform to 1980 volumes because of changes in survey definitions and procedures.

Table 90.--Annual mortality of growing stock on commercial forest land by species group and cause, Kansas, 1980

(In thousand cubic feet)

| Species group | All causes | Cause | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS | | | | | | | | |
| Eastern redcedar | 28 | -- | -- | -- | -- | -- | 28 | -- |
| Total | 28 | -- | -- | -- | -- | -- | 28 | -- |
| HARDWOODS | | | | | | | | |
| Bur oak | 220 | -- | 117 | 4 | -- | 6 | -- | 93 |
| Select white oak | 94 | -- | 22 | -- | 28 | -- | -- | 44 |
| Other white oak | 46 | -- | -- | 12 | -- | -- | -- | 34 |
| Select red oak | 210 | -- | 77 | -- | -- | 42 | -- | 91 |
| Other red oak | 216 | -- | 115 | -- | -- | 52 | -- | 49 |
| Select hickory | 39 | -- | 29 | -- | -- | -- | -- | 10 |
| Other hickory | 10 | -- | 7 | -- | -- | -- | -- | 3 |
| Pecan | -- | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 12 | -- | -- | -- | -- | -- | -- | 12 |
| Ash | 177 | -- | 20 | -- | -- | 10 | 3 | 144 |
| Cottonwood | 853 | 122 | 91 | -- | 66 | 153 | -- | 421 |
| Basswood | 6 | -- | 6 | -- | -- | -- | -- | -- |
| Elm | 1,283 | 7 | 865 | 8 | -- | 27 | -- | 376 |
| Black walnut | 223 | -- | 55 | 5 | -- | -- | -- | 163 |
| Willow | 57 | -- | 17 | -- | -- | -- | -- | 40 |
| Boxelder | 40 | -- | -- | -- | -- | 35 | 5 | -- |
| Hackberry | 158 | -- | 93 | 6 | -- | -- | -- | 59 |
| Sycamore | 69 | -- | -- | -- | -- | -- | -- | 69 |
| Other hardwoods | 26 | -- | -- | -- | -- | -- | -- | 26 |
| Total | 3,739 | 129 | 1,514 | 35 | 94 | 325 | 8 | 1,634 |
| All species | 3,767 | 129 | 1,514 | 35 | 94 | 325 | 36 | 1,634 |

Table 91.--Annual mortality of sawtimber on commercial forest land by species group and cause, Kansas, 1980

(In thousand board feet)[1]

| Species group | All causes | Cause |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  | Insects | Disease | Fire | Animals | Weather | Suppression | Unknown and other |
| SOFTWOODS |  |  |  |  |  |  |  |  |
| Eastern redcedar | 157 | -- | -- | -- | -- | -- | 157 | -- |
| Total | 157 | -- | -- | -- | -- | -- | 157 | -- |
| HARDWOODS |  |  |  |  |  |  |  |  |
| Bur oak | 484 | -- | 119 | 21 | -- | 28 | -- | 316 |
| Select white oak | 247 | -- | 93 | -- | 133 | -- | -- | 21 |
| Other white oak | 91 | -- | -- | 23 | -- | -- | -- | 68 |
| Select red oak | 660 | -- | 356 | -- | -- | 174 | -- | 130 |
| Other red oak | 1,145 | -- | 624 | -- | -- | 292 | -- | 229 |
| Select hickory | 71 | -- | 26 | -- | -- | -- | -- | 45 |
| Other hickory | 34 | -- | 34 | -- | -- | -- | -- | -- |
| Pecan | -- | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | -- | -- | -- | -- | -- | -- | -- | -- |
| Soft maple | 56 | -- | -- | -- | -- | -- | -- | 56 |
| Ash | 716 | -- | 89 | -- | -- | 48 | -- | 579 |
| Cottonwood | 2,651 | 614 | 371 | -- | 332 | 459 | -- | 875 |
| Basswood | -- | -- | -- | -- | -- | -- | -- | -- |
| Elm | 4,295 | 30 | 2,944 | -- | -- | 126 | -- | 1,195 |
| Black walnut | 773 | -- | 135 | 26 | -- | -- | -- | 612 |
| Willow | 85 | -- | 85 | -- | -- | -- | -- | -- |
| Boxelder | -- | -- | -- | -- | -- | -- | -- | -- |
| Hackberry | 599 | -- | 397 | 30 | -- | -- | -- | 172 |
| Sycamore | 195 | -- | -- | -- | -- | -- | -- | 195 |
| Other hardwoods | 60 | -- | -- | -- | -- | -- | -- | 60 |
| Total | 12,162 | 644 | 5,273 | 100 | 465 | 1,127 | -- | 4,553 |
| All species | 12,319 | 644 | 5,273 | 100 | 465 | 1,127 | 157 | 4,553 |

[1] International 1/4-inch rule.

Table 92.--Annual mortality of growing stock and sawtimber on commercial forest land by ownership class and softwoods and hardwoods, Kansas, 1980

| Ownership class | Growing stock |  |  | Sawtimber |  |  |
|---|---|---|---|---|---|---|
|  | All species | Softwoods | Hardwoods | All species | Softwoods | Hardwoods |
|  | - - - Thousand cubic feet- - - |  |  | - - - - Thousand board feet[1] - - - - |  |  |
| National Forest | -- | -- | -- | -- | -- | -- |
| Miscellaneous federal | 36 | -- | 36 | 127 | -- | 127 |
| Indian | -- | -- | -- | -- | -- | -- |
| State | -- | -- | -- | -- | -- | -- |
| County and municipal | -- | -- | -- | -- | -- | -- |
| Farmer | 2,027 | 28 | 1,999 | 7,104 | 157 | 6,947 |
| Misc. private | 1,704 | -- | 1,704 | 5,088 | -- | 5,088 |
| All owners | 3,767 | 28 | 3,739 | 12,319 | 157 | 12,162 |

[1] International 1/4-inch rule.

Table 93.--Output of timber products by product, softwoods and hardwoods, and source of material, Kansas, 1980

| Product and softwoods and hardwoods | Standard units | Total | | Roundwood products | | | | Plant byproducts | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Growing stock | | Nongrowing stock | | | |
| | | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet | No. of units | Thousand cubic feet |
| SAW LOGS | | | | | | | | | |
| Softwood | Thousand board feet[1] | 321 | 66 | 321 | 66 | -- | -- | -- | -- |
| Hardwood | | 31,565 | 5,036 | 26,789 | 4,274 | 4,776 | 762 | -- | -- |
| Total | | 31,886 | 5,102 | 27,110 | 4,340 | 4,776 | 762 | -- | -- |
| VENEER LOGS | | | | | | | | | |
| Softwood | Thousand board feet[1] | -- | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | | 537 | 81 | 473 | 72 | 64 | 9 | -- | -- |
| Total | | 537 | 81 | 473 | 72 | 64 | 9 | -- | -- |
| COOPERAGE | | | | | | | | | |
| Softwood | Thousand board feet[1] | -- | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | | 264 | 44 | 240 | 40 | 24 | 4 | -- | -- |
| Total | | 264 | 44 | 240 | 40 | 24 | 4 | -- | -- |
| FUELWOOD | | | | | | | | | |
| Softwood | Standard cords[2] | 160 | 11 | -- | -- | -- | -- | 160 | 11 |
| Hardwood | | 272,926 | 19,098 | 108,285 | 7,577 | 146,715 | 10,266 | 17,926 | 1,255 |
| Total | | 273,086 | 19,109 | 108,285 | 7,577 | 146,715 | 10,266 | 18,086 | 1,266 |
| POSTS | | | | | | | | | |
| Softwood | Thousand pieces | 35 | 26 | 24 | 18 | 11 | 8 | -- | -- |
| Hardwood | | 315 | 177 | 61 | 34 | 254 | 143 | -- | -- |
| Total | | 350 | 203 | 85 | 52 | 265 | 151 | -- | -- |
| OTHER[3] | | | | | | | | | |
| Softwood | Thousand cubic feet | 6 | 6 | -- | -- | -- | -- | 6 | 6 |
| Hardwood | | 470 | 470 | -- | -- | -- | -- | 470 | 470 |
| Total | | 476 | 476 | -- | -- | -- | -- | 476 | 476 |
| ALL PRODUCTS | | | | | | | | | |
| Softwood | Thousand cubic feet | -- | 109 | -- | 84 | -- | 8 | -- | 17 |
| Hardwood | | -- | 24,906 | -- | 11,997 | -- | 11,184 | -- | 1,725 |
| Total | | -- | 25,015 | -- | 12,081 | -- | 11,192 | -- | 1,742 |

[1] International 1/4-inch rule.

[2] Unpeeled, 128 cubic-foot basis.

[3] Includes charcoal wood, livestock bedding, mulch, and specialty items.

Table 94.--Output of roundwood products by product, softwoods and hardwoods, and source of material, Kansas, 1980

(In thousand cubic feet)

| Product and soft-woods and hardwoods | All sources | Growing-stock trees |  |  | Rough and rotten trees | Salvable dead trees | Other sources |
|---|---|---|---|---|---|---|---|
|  |  | Total | Sawtimber | Poletimber |  |  |  |
| INDUSTRIAL PRODUCTS |  |  |  |  |  |  |  |
| Saw logs |  |  |  |  |  |  |  |
| Softwood | 66 | 66 | 66 | -- | -- | -- | -- |
| Hardwood | 5,036 | 4,274 | 4,243 | 31 | 547 | 20 | 195 |
| Subtotal | 5,102 | 4,340 | 4,309 | 31 | 547 | 20 | 195 |
| Veneer logs |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 81 | 72 | 72 | -- | -- | -- | 9 |
| Subtotal | 81 | 72 | 72 | -- | -- | -- | 9 |
| Cooperage |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 44 | 40 | 40 | -- | 4 | -- | -- |
| Subtotal | 44 | 40 | 40 | -- | 4 | -- | -- |
| Posts (Round and split) |  |  |  |  |  |  |  |
| Softwood | 26 | 18 | 6 | 12 | -- | 1 | 7 |
| Hardwood | 177 | 34 | 24 | 10 | 6 | -- | 137 |
| Subtotal | 203 | 52 | 30 | 22 | 6 | 1 | 144 |
| All industrial products |  |  |  |  |  |  |  |
| Softwood | 92 | 84 | 72 | 12 | -- | 1 | 7 |
| Hardwood | 5,338 | 4,420 | 4,379 | 41 | 557 | 20 | 341 |
| Total | 5,430 | 4,504 | 4,451 | 53 | 557 | 21 | 348 |
| FUELWOOD |  |  |  |  |  |  |  |
| Softwood | -- | -- | -- | -- | -- | -- | -- |
| Hardwood | 17,843 | 7,577 | 4,177 | 3,400 | 3,734 | 266 | 6,266 |
| Total | 17,843 | 7,577 | 4,177 | 3,400 | 3,734 | 266 | 6,266 |
| ALL PRODUCTS |  |  |  |  |  |  |  |
| Softwood | 92 | 84 | 72 | 12 | -- | 1 | 7 |
| Hardwood | 23,181 | 11,997 | 8,556 | 3,441 | 4,291 | 286 | 6,607 |
| Total | 23,273 | 12,081 | 8,628 | 3,453 | 4,291 | 287 | 6,614 |

Table 95.--Timber products from roundwood by species group and product, Kansas, 1980

| Species group | All products | Saw logs | | Veneer logs | | Fuelwood | | Posts | | Cooperage logs | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet | Cords | Thousand cubic feet | Thousand pieces | Thousand cubic feet | Thousand board feet[1] | Thousand cubic feet |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 92 | 321 | 66 | -- | -- | -- | -- | 35 | 26 | -- | -- |
| Total | 92 | 321 | 66 | -- | -- | -- | -- | 35 | 26 | -- | -- |
| HARDWOODS | | | | | | | | | | | |
| White oak | 4,669 | 3,225 | 569 | 59 | 12 | 57,573 | 4,030 | 26 | 14 | 264 | 44 |
| Red oak | 3,645 | 2,931 | 521 | -- | -- | 44,427 | 3,111 | 27 | 13 | -- | -- |
| Hickory | 545 | 74 | 11 | -- | -- | 7,650 | 534 | -- | -- | -- | -- |
| Pecan | 57 | 348 | 57 | -- | -- | -- | -- | -- | -- | -- | -- |
| Hard maple | 25 | -- | -- | -- | -- | 400 | 25 | -- | -- | -- | -- |
| Soft maple | 779 | 1,543 | 246 | -- | -- | 7,650 | 533 | -- | -- | -- | -- |
| Ash | 2,685 | 2,183 | 367 | -- | -- | 33,150 | 2,318 | -- | -- | -- | -- |
| Cottonwood | 1,832 | 6,107 | 940 | -- | -- | 12,750 | 892 | -- | -- | -- | -- |
| Basswood | 18 | 10 | 1 | -- | -- | 250 | 17 | -- | -- | -- | -- |
| Elm | 1,116 | 1,458 | 222 | -- | -- | 12,750 | 894 | -- | -- | -- | -- |
| Black walnut | 1,609 | 8,955 | 1,362 | 478 | 69 | 2,550 | 178 | -- | -- | -- | -- |
| Hackberry | 1,931 | 3,193 | 504 | -- | -- | 20,400 | 1,427 | -- | -- | -- | -- |
| Sycamore | 397 | 1,417 | 218 | -- | -- | 2,550 | 179 | -- | -- | -- | -- |
| Other hardwoods[2] | 3,873 | 121 | 18 | -- | -- | 52900 | 3,705 | 262 | 150 | -- | -- |
| Total | 23,181 | 31,565 | 5,036 | 537 | 81 | 255,000 | 17,843 | 315 | 177 | 264 | 44 |
| All species | 23,273 | 31,886 | 5,102 | 537 | 81 | 255,000 | 17,843 | 350 | 203 | 264 | 44 |

[1] International 1/4-inch rule.

[2] Includes willow and boxelder species groups.

Table 96.--Volume of primary plant residue by type of use and kind of material, Kansas, 1980

(In thousand cubic feet)

| | Kind of wood residue | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | Coarse[1] | | Fine[2] | | Bark | |
| Type of use | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood | Softwood | Hardwood |
| Fiber products | -- | 298.1 | -- | 298.1 | -- | -- | -- | -- |
| Industrial fuel | -- | 677.8 | -- | 433.3 | -- | 244.5 | -- | 279.8 |
| Domestic fuel | 11.2 | 577.0 | 10.6 | 536.5 | 0.6 | 40.5 | 3.7 | 335.4 |
| Miscellaneous[3] | 6.1 | 469.6 | 0.2 | 13.0 | 5.9 | 456.6 | 0.1 | 7.2 |
| Not used[4] | 6.3 | 664.8 | 4.1 | 413.8 | 2.2 | 251.0 | 1.5 | 455.1 |
| Total | 23.6 | 2,687.3 | 14.9 | 1,694.7 | 8.7 | 992.6 | 5.3 | 1,077.5 |

[1] Suitable for chipping such as slabs, edgings, veneer cores, etc.

[2] Not suitable for chipping such as sawdust, veneer clippings, etc.

[3] Livestock bedding, mulch, small dimension, charcoal, and specialty items.

[4] Includes residue burned as waste.

Table 97.--All live shrub biomass yields on commercial forest land by species group and forest type, Kansas, 1981

(In pounds per acre green weight)

| Species | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| TALL SHRUBS | | | | | | | | | | |
| Eastern redcedar | 244 | 11 | 2 | 13 | 3 | -- | -- | -- | 9 | -- |
| Boxelder | -- | -- | -- | -- | 13 | 39 | -- | 10 | -- | -- |
| Silver maple | -- | -- | -- | -- | 10 | -- | -- | -- | -- | -- |
| Sugar maple | -- | 3 | -- | -- | 2 | -- | -- | -- | 5 | -- |
| Ailanthus | -- | 75 | -- | -- | -- | -- | -- | -- | -- | -- |
| Bitternut hickory | -- | 14 | 5 | 12 | -- | -- | -- | 8 | -- | -- |
| Shagbark hickory | 5 | 14 | -- | 2 | -- | -- | -- | -- | 1 | -- |
| Hackberry | -- | 29 | 5 | 18 | 20 | 1 | -- | 107 | 3 | 2 |
| Eastern redbud | -- | 34 | 20 | 44 | 23 | -- | -- | 9 | 16 | -- |
| Roughleaf dogwood | 1,411 | 215 | 55 | 164 | 253 | 239 | 1,778 | 173 | 561 | 92 |
| Hawthorn | -- | 12 | -- | -- | 14 | -- | -- | -- | 3 | -- |
| White ash | -- | 8 | -- | -- | -- | -- | -- | -- | 4 | -- |
| Green ash | -- | 118 | 1 | 12 | 19 | 82 | -- | 136 | 15 | -- |
| Honeylocust | 1 | 8 | -- | 18 | 29 | -- | -- | 8 | 30 | 6 |
| Black walnut | -- | 13 | -- | 25 | 3 | -- | -- | 12 | 5 | -- |
| Osage-orange | -- | 5 | -- | 28 | 1 | -- | -- | -- | 7 | 6 |
| Red mulberry | -- | 5 | 2 | 3 | 7 | 37 | 177 | 2 | 9 | -- |
| Eastern hophornbeam | -- | 18 | 4 | 3 | -- | -- | -- | -- | -- | -- |
| Eastern cottonwood | -- | -- | -- | -- | 4 | -- | -- | -- | -- | -- |
| Black cherry | -- | 3 | -- | 11 | -- | -- | -- | -- | 1 | 3 |
| Chokecherry | -- | 11 | -- | 2 | 2 | 30 | -- | 11 | 4 | -- |
| Wild plum | -- | -- | -- | -- | 3 | -- | -- | 3 | 2 | -- |
| Pawpaw | -- | 7 | -- | 15 | 2 | -- | -- | 21 | -- | -- |
| White oak | -- | -- | 46 | -- | -- | -- | -- | -- | -- | -- |
| Bur oak | -- | 4 | 1 | 1 | -- | -- | -- | 4 | -- | -- |
| Chinkapin oak | 24 | 15 | 1 | 5 | -- | -- | -- | 10 | 5 | -- |
| Northern red oak | 5 | 8 | 8 | -- | -- | -- | -- | 2 | 8 | -- |
| Black oak | 1 | 5 | -- | -- | -- | -- | -- | -- | 10 | -- |
| Beaked hazel | 931 | 32 | -- | -- | -- | -- | -- | 25 | -- | -- |
| Prickly ash | -- | -- | -- | 30 | 58 | -- | -- | -- | 3 | -- |
| Viburnum | -- | 5 | -- | 1 | -- | -- | -- | -- | -- | -- |
| Elder | -- | 6 | -- | -- | 19 | -- | -- | -- | -- | -- |
| Sumac | 39 | 22 | 28 | 1 | 7 | -- | -- | 4 | 49 | 70 |
| Buttonbush | -- | -- | -- | -- | 2 | -- | -- | -- | -- | -- |
| Wahoo | -- | 4 | -- | -- | -- | -- | -- | 2 | -- | -- |
| Willow | -- | -- | -- | -- | 29 | 28 | 694 | 1 | -- | 3 |
| Sassafras | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| American basswood | -- | 3 | -- | 15 | -- | 2 | -- | -- | -- | -- |
| American elm | 46 | 66 | 22 | 49 | 39 | -- | -- | 148 | 108 | 7 |
| Siberian elm | -- | 5 | -- | -- | -- | -- | -- | -- | -- | -- |
| Slippery elm | -- | 54 | -- | 21 | 20 | 16 | -- | 26 | 34 | -- |
| Total | 2,707 | 834 | 200 | 493 | 582 | 474 | 2,649 | 722 | 892 | 189 |

(Table 97 continued on next page)

(Table 97 continued)

| Species | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| LOW SHRUBS | | | | | | | | | | |
| Virginia creeper | 2 | 7 | 3 | 1 | -- | 30 | -- | 3 | -- | -- |
| Gooseberry-currant | -- | 8 | -- | -- | 12 | 2 | -- | 9 | 2 | -- |
| Raspberry-blackberry | -- | -- | 1 | -- | -- | -- | 8 | 1 | 3 | -- |
| Rose | -- | 3 | -- | -- | 1 | -- | -- | -- | 6 | 4 |
| American bladdernut | -- | 3 | -- | -- | 1 | -- | -- | -- | -- | -- |
| Bilberry-blueberry | -- | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| Honeysuckle | -- | -- | -- | 7 | 7 | 13 | -- | 6 | 2 | -- |
| Buckbrush | 58 | 119 | 186 | 166 | 128 | 18 | 129 | 150 | 155 | 59 |
| Poison ivy | -- | 6 | 2 | 2 | 10 | 58 | -- | 8 | 4 | 6 |
| Pipe-vine | -- | -- | 2 | 1 | -- | -- | -- | -- | -- | -- |
| Moonseed | -- | 4 | -- | -- | 1 | -- | -- | 3 | -- | -- |
| Greenbrier | -- | -- | -- | -- | -- | 3 | -- | 1 | 1 | -- |
| Grape | -- | -- | -- | -- | -- | 2 | -- | 2 | -- | -- |
| Total | 60 | 152 | 194 | 177 | 160 | 126 | 137 | 183 | 173 | 69 |
| All shrub species | 2,767 | 986 | 394 | 670 | 742 | 600 | 2,786 | 905 | 1,065 | 258 |
| Number of plots[1] | 20 | 265 | 26 | 42 | 206 | 32 | 4 | 213 | 90 | 33 |

[1] Number of plots by forest type from which average yields were derived.

Table 98.--All live tree biomass yields on commercial forest land by species group and forest type, Kansas, 1981

(In pounds per acre green weight)

| Species | Forest type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | |
| Eastern redcedar | 13,952 | 253 | -- | 1,136 | 28 | -- | -- | 225 | 519 | 218 |
| Total | 13,952 | 253 | -- | 1,136 | 28 | -- | -- | 225 | 519 | 218 |
| HARDWOODS | | | | | | | | | | |
| Bur oak | 1,310 | 13,214 | 1,831 | 10,067 | 2,209 | -- | -- | 10,714 | 522 | 1,586 |
| Select white oak | 5,363 | 16,310 | 235 | 3,338 | 831 | -- | -- | 999 | 1,243 | -- |
| Other white oak | 2,824 | 2,952 | 69,507 | 790 | -- | -- | -- | -- | 62 | -- |
| Select red oak | 294 | 15,010 | 4,359 | 1,743 | 909 | -- | -- | 1,605 | 1,835 | 175 |
| Other red oak | -- | 9,742 | 10,794 | 959 | 548 | 53 | -- | 719 | 488 | 663 |
| Select hickory | 523 | 6,233 | 1,444 | 658 | 762 | -- | -- | 698 | 688 | 149 |
| Other hickory | -- | 3,273 | 1,289 | 1,985 | 611 | -- | -- | 1,831 | 145 | -- |
| Pecan | -- | 3,185 | -- | 315 | 621 | -- | -- | 95 | 349 | -- |
| Hard maple | -- | 935 | -- | -- | 472 | -- | -- | 79 | 364 | -- |
| Soft maple | -- | 127 | -- | -- | 5,336 | 388 | -- | 1,877 | 186 | 148 |
| Ash | 597 | 3,014 | -- | 2,354 | 17,211 | 2,504 | 5,626 | 5,155 | 3,565 | 2,161 |
| Cottonwood | 113 | 452 | -- | 1,305 | 11,942 | 131,993 | 8,327 | 1,951 | 1,850 | 2,236 |
| Basswood | -- | 1,082 | -- | 3,152 | 188 | 1,266 | -- | 319 | 447 | -- |
| Elm | 2,899 | 4,530 | 913 | 7,587 | 10,127 | 1,787 | 1,534 | 7,445 | 11,455 | 6,111 |
| Black walnut | 3,832 | 4,845 | 1,105 | 16,248 | 2,555 | 842 | -- | 14,537 | 3,238 | 386 |
| Willow | -- | 113 | -- | 107 | 4,065 | 1,925 | 40,718 | 360 | 557 | 377 |
| Boxelder | -- | 205 | -- | 713 | 5,834 | 1,781 | 1,741 | 2,875 | 406 | 1,153 |
| Hackberry | 1,232 | 2,504 | 274 | 13,739 | 6,751 | 1,522 | 170 | 29,074 | 3,111 | 1,528 |
| Sycamore | -- | 924 | -- | 619 | 2,375 | 477 | -- | 3,595 | 553 | 254 |
| Other hardwoods | 1,561 | 2,473 | 516 | 6,651 | 9,389 | 8,505 | 1,498 | 8,726 | 9,315 | 7,547 |
| Noncommercial species | 7,163 | 3,541 | 429 | 11,043 | 4,955 | 45 | -- | 3,816 | 5,448 | 6,534 |
| Total | 27,711 | 94,664 | 92,696 | 83,373 | 87,691 | 153,088 | 59,614 | 96,470 | 45,827 | 31,008 |
| All species | 41,663 | 94,917 | 92,696 | 84,509 | 87,719 | 153,088 | 59,614 | 96,695 | 46,346 | 31,226 |
| Number of plots[1/] | 20 | 265 | 27 | 42 | 206 | 37 | 4 | 213 | 90 | 33 |

---

[1/] Number of plots by forest type from which average yields were derived.

Table 99.--All live tree biomass on commercial forest land by species group and forest type, Kansas, 1981

(In green tons)

| | | Forest type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species | All types | Eastern redcedar-hardwood | Oak-hickory | Post-blackjack oak | Upland plains hardwoods | Elm-ash-cottonwood | Cottonwood | Willow | Lowland plains hardwoods | Upland elm-ash-locust | Non-stocked |
| SOFTWOODS | | | | | | | | | | | |
| Eastern redcedar | 327,473 | 191,845 | 40,070 | -- | 28,064 | 4,008 | -- | -- | 29,936 | 28,607 | 4,943 |
| Total | 327,473 | 191,845 | 40,070 | -- | 28,064 | 4,008 | -- | -- | 29,936 | 28,607 | 4,943 |
| HARDWOODS | | | | | | | | | | | |
| Bur oak | 4,195,728 | 18,006 | 2,091,706 | 28,289 | 248,662 | 319,853 | -- | -- | 1,424,444 | 28,772 | 35,996 |
| Select white oak | 3,063,270 | 73,746 | 2,581,779 | 3,628 | 82,460 | 120,304 | -- | -- | 132,779 | 68,574 | -- |
| Other white oak | 1,602,916 | 38,832 | 467,252 | 1,073,883 | 19,513 | -- | -- | -- | -- | 3,436 | -- |
| Select red oak | 2,940,607 | 4,037 | 2,375,982 | 67,344 | 43,040 | 131,694 | -- | -- | 213,358 | 101,190 | 3,962 |
| Other red oak | 1,951,281 | -- | 1,542,203 | 166,773 | 23,692 | 79,286 | 1,794 | -- | 95,554 | 26,937 | 15,042 |
| Select hickory | 1,276,927 | 7,190 | 986,708 | 22,309 | 16,241 | 110,375 | -- | -- | 92,792 | 37,933 | 3,379 |
| Other hickory | 926,926 | -- | 518,191 | 19,908 | 49,021 | 88,421 | -- | -- | 243,396 | 7,989 | -- |
| Pecan | 633,788 | -- | 504,246 | -- | 7,786 | 89,917 | -- | -- | 12,575 | 19,264 | -- |
| Hard maple | 246,808 | -- | 147,954 | -- | -- | 68,317 | -- | -- | 10,448 | 20,089 | -- |
| Soft maple | 1,069,121 | -- | 20,155 | -- | -- | 772,645 | 13,213 | -- | 249,481 | 10,270 | 3,357 |
| Ash | 4,063,618 | 8,210 | 477,086 | -- | 58,152 | 2,492,180 | 85,263 | 11,814 | 685,297 | 196,554 | 49,062 |
| Cottonwood | 6,758,532 | 1,560 | 71,515 | -- | 32,237 | 1,729,227 | 4,494,369 | 17,486 | 259,323 | 102,048 | 50,767 |
| Basswood | 386,444 | -- | 171,258 | -- | 77,858 | 27,178 | 43,118 | -- | 42,362 | 24,670 | -- |
| Elm | 4,249,130 | 39,858 | 717,096 | 14,107 | 187,401 | 1,466,383 | 60,844 | 3,221 | 989,815 | 631,686 | 138,719 |
| Black walnut | 3,756,931 | 52,690 | 766,988 | 17,073 | 401,339 | 369,970 | 28,655 | -- | 1,932,843 | 178,600 | 8,773 |
| Willow | 847,383 | -- | 17,939 | -- | 2,632 | 588,569 | 65,544 | 85,509 | 47,907 | 30,718 | 8,565 |
| Boxelder | 1,390,074 | -- | 32,515 | -- | 17,602 | 844,819 | 60,639 | 3,657 | 382,291 | 22,376 | 26,175 |
| Hackberry | 5,858,598 | 16,942 | 396,428 | 4,240 | 339,359 | 977,604 | 51,832 | 358 | 3,865,563 | 171,587 | 34,685 |
| Sycamore | 1,035,946 | -- | 146,290 | -- | 15,292 | 343,938 | 16,250 | -- | 477,916 | 30,488 | 5,772 |
| Other hardwoods | 4,082,630 | 21,463 | 391,456 | 7,972 | 164,268 | 1,359,554 | 289,607 | 3,145 | 1,160,155 | 513,686 | 171,324 |
| Noncommercial species | 2,613,645 | 98,496 | 560,570 | 6,633 | 272,761 | 717,505 | 1,519 | -- | 507,371 | 300,481 | 148,309 |
| Total | 52,950,303 | 381,030 | 14,985,317 | 1,432,159 | 2,059,316 | 12,697,739 | 5,212,647 | 125,190 | 12,825,670 | 2,527,348 | 703,887 |
| All species | 53,277,776 | 572,875 | 15,025,387 | 1,432,159 | 2,087,380 | 12,701,747 | 5,212,647 | 125,190 | 12,855,606 | 2,555,955 | 708,830 |

Table 100.--All live tree biomass weight by species group and tree biomass component, Kansas, 1981

(In green tons)

| | | Biomass component | | | | |
|---|---|---|---|---|---|---|
| | | | Growing stock | | Cull | |
| Species group | All components | 1- to 5-inch trees | Boles | Tops and limbs | Boles | Tops and limbs |
| SOFTWOODS | | | | | | |
| Eastern redcedar | 327,473 | 185,195 | 76,966 | 39,582 | 16,506 | 9,224 |
| Total | 327,473 | 185,195 | 76,966 | 39,582 | 16,506 | 9,224 |
| HARDWOODS | | | | | | |
| Bur oak | 4,195,728 | 94,805 | 2,185,284 | 1,090,531 | 501,823 | 323,285 |
| Select white oak | 3,063,270 | 208,450 | 1,240,484 | 603,806 | 645,782 | 364,748 |
| Other white oak | 1,602,916 | 302,447 | 722,386 | 337,549 | 149,595 | 90,939 |
| Select red oak | 2,940,607 | 127,093 | 1,626,511 | 806,614 | 199,869 | 180,520 |
| Other red oak | 1,951,281 | 113,136 | 995,059 | 513,525 | 194,493 | 135,068 |
| Select hickory | 1,276,927 | 214,208 | 636,484 | 296,069 | 76,937 | 53,229 |
| Other hickory | 926,926 | 207,121 | 429,551 | 199,223 | 58,796 | 32,235 |
| Pecan | 633,788 | 55,007 | 325,064 | 158,518 | 59,919 | 35,280 |
| Hard maple | 246,808 | 80,305 | 100,799 | 51,224 | 9,013 | 5,467 |
| Soft maple | 1,069,121 | 37,415 | 568,119 | 280,018 | 98,492 | 85,077 |
| Ash | 4,063,618 | 643,970 | 1,798,134 | 950,412 | 395,050 | 276,052 |
| Cottonwood | 6,758,532 | 42,901 | 4,089,652 | 1,992,493 | 350,178 | 283,308 |
| Basswood | 386,444 | 71,834 | 160,590 | 78,287 | 45,154 | 30,579 |
| Elm | 4,249,130 | 1,675,863 | 954,679 | 460,438 | 716,885 | 441,265 |
| Black walnut | 3,756,931 | 462,570 | 1,810,684 | 897,619 | 359,420 | 226,638 |
| Willow | 847,383 | 70,076 | 363,096 | 182,509 | 129,187 | 102,515 |
| Boxelder | 1,390,074 | 181,341 | 325,485 | 161,496 | 412,301 | 309,451 |
| Hackberry | 5,858,598 | 897,608 | 2,696,133 | 1,312,562 | 589,163 | 363,132 |
| Sycamore | 1,035,946 | 36,229 | 621,590 | 293,367 | 45,665 | 39,095 |
| Other hardwoods | 4,082,630 | 897,973 | 1,065,951 | 520,732 | 967,516 | 630,458 |
| Noncommercial species | 2,613,645 | 1,077,736 | -- | -- | 1,013,171 | 522,738 |
| Total | 52,950,303 | 7,498,088 | 22,715,735 | 11,186,992 | 7,018,409 | 4,531,079 |
| All species | 53,277,776 | 7,683,283 | 22,792,701 | 11,226,574 | 7,034,915 | 4,540,303 |

Table 101.--All live tree biomass volume by species group and tree biomass component, Kansas, 1981

(In thousand cubic feet)

| Species group | All components | Biomass component: 1- to 5-inch trees | Growing stock: Boles | Growing stock: Tops and limbs | Cull: Boles | Cull: Tops and limbs |
|---|---|---|---|---|---|---|
| SOFTWOODS | | | | | | |
| Eastern redcedar | 17,701 | 10,010 | 4,160 | 2,140 | 892 | 499 |
| Total | 17,701 | 10,010 | 4,160 | 2,140 | 892 | 499 |
| HARDWOODS | | | | | | |
| Bur oak | 368,784 | 34,164 | 179,043 | 89,298 | 40,528 | 25,751 |
| Select white oak | 109,230 | 7,157 | 43,999 | 21,433 | 23,271 | 13,370 |
| Other white oak | 56,862 | 10,384 | 25,633 | 11,992 | 5,449 | 3,404 |
| Select red oak | 103,985 | 4,364 | 56,954 | 28,258 | 7,408 | 7,001 |
| Other red oak | 68,077 | 3,829 | 34,501 | 17,850 | 6,940 | 4,957 |
| Select hickory | 44,514 | 7,249 | 22,187 | 10,323 | 2,783 | 1,972 |
| Other hickory | 32,220 | 7,009 | 15,003 | 6,961 | 2,087 | 1,160 |
| Pecan | 27,992 | 2,290 | 14,413 | 7,030 | 2,677 | 1,582 |
| Hard maple | 9,386 | 3,022 | 3,846 | 1,956 | 349 | 213 |
| Soft maple | 46,315 | 1,615 | 24,462 | 12,060 | 4,322 | 3,856 |
| Ash | 174,828 | 27,287 | 77,186 | 40,845 | 17,208 | 12,302 |
| Cottonwood | 294,105 | 1,818 | 177,508 | 86,499 | 15,405 | 12,875 |
| Basswood | 19,326 | 3,556 | 8,028 | 3,915 | 2,275 | 1,552 |
| Elm | 167,526 | 65,145 | 37,546 | 18,117 | 28,636 | 18,082 |
| Black walnut | 136,037 | 16,867 | 65,030 | 32,282 | 13,254 | 8,604 |
| Willow | 36,529 | 2,917 | 15,540 | 7,815 | 5,658 | 4,599 |
| Boxelder | 66,021 | 8,280 | 15,350 | 7,619 | 19,703 | 15,069 |
| Hackberry | 250,191 | 37,361 | 115,285 | 56,136 | 25,467 | 15,942 |
| Sycamore | 41,662 | 1,456 | 24,869 | 11,739 | 1,907 | 1,691 |
| Other hardwoods | 174,256 | 37,481 | 45,228 | 22,111 | 41,738 | 27,698 |
| Noncommercial species | 110,226 | 44,859 | -- | -- | 43,067 | 22,300 |
| Total | 2,338,072 | 328,110 | 1,001,611 | 494,239 | 310,132 | 203,980 |
| All species | 2,355,773 | 338,120 | 1,005,771 | 496,379 | 311,024 | 204,479 |

Table 102.--Sampling errors[1] for estimates smaller than the State totals of volume, net growth, removals, and area of commercial forest land, Kansas, 1981

| Sampling error | Commercial forest area | Growing Stock: Inventory | Growing Stock: Growth | Growing Stock: Removals | Sawtimber: Inventory | Sawtimber: Growth | Sawtimber: Removals |
|---|---|---|---|---|---|---|---|
| Percent | Thousand acres | - - - Million cubic feet - - - | | | - - - Million board feet[2] - - - | | |
| 1 | 7,250.4 | 8,813.5 | 825.4 | 4,046.0 | 46,135.7 | 3,349.3 | 21,493.3 |
| 2 | 1,812.6 | 2,203.4 | 206.3 | 1,011.5 | 11,533.9 | 837.3 | 5,373.3 |
| 3 | 805.6 | 979.3 | 91.7 | 449.6 | 5,126.2 | 372.1 | 2,388.1 |
| 4 | 453.2 | 550.8 | 51.6 | 252.9 | 2,883.5 | 209.3 | 1,343.3 |
| 5 | 290.0 | 352.5 | 33.0 | 161.8 | 1,845.4 | 134.0 | 859.7 |
| 10 | 72.5 | 88.1 | 8.3 | 40.5 | 461.4 | 33.5 | 214.9 |
| 15 | 32.2 | 39.2 | 3.7 | 18.0 | 205.0 | 14.9 | 95.5 |
| 20 | 18.1 | 22.0 | 2.1 | 10.1 | 115.3 | 8.4 | 53.7 |
| 25 | 11.6 | 14.1 | 1.3 | 6.5 | 73.8 | 5.4 | 34.4 |
| 50 | 2.9 | 3.5 | 0.3 | 1.6 | 18.5 | 1.3 | 8.6 |
| 100 | 0.7 | 0.9 | 0.1 | 0.4 | 4.6 | 0.3 | 2.1 |

[1] At the 68-percent probability level.

[2] International 1/4-inch rule.

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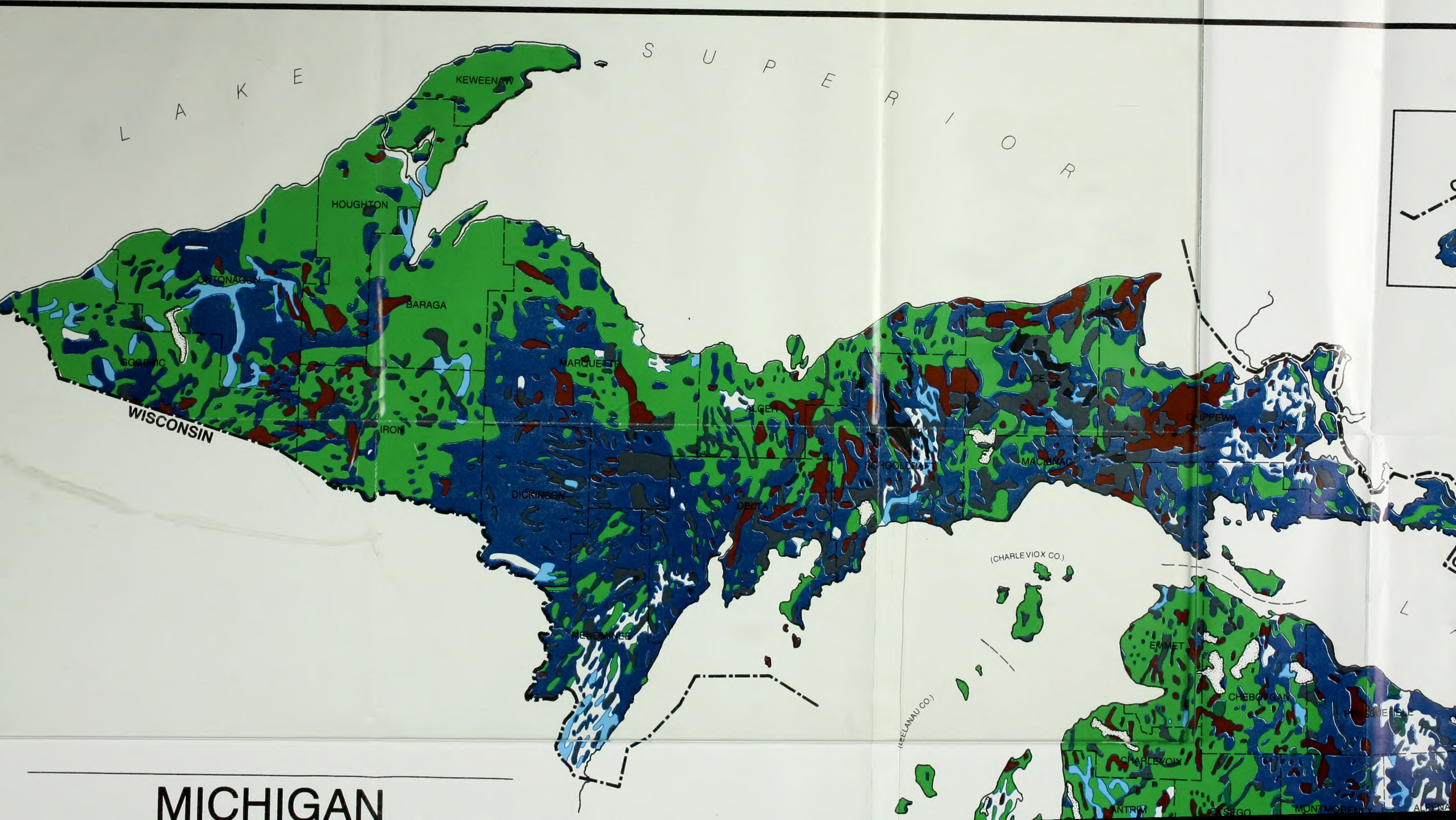
Raile, Gerhard K.; Spencer, John S., Jr.

Kansas forest statistics, 1981. Resour. Bull. NC-70. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 1984. 124 p.

The third inventory of the timber resource of Kansas shows a 1.4 percent increase in commercial forest area and a 42 percent gain in growing-stock volume between 1965 and 1981. Highlights and statistics are presented on area, volume, growth, mortality, removals, utilization and biomass.

KEY WORDS: Area, volume, growth, mortality, removals.


LAKE SUPERIOR
KEWEENAW
HOUGHTON
ONTONAGON
BARAGA
GOGEBIC
MARQUETTE
WISCONSIN
IRON
ALGER
LUCE
CHIPPEWA
SCHOOLCRAFT
MACKINAC
DICKINSON
DELTA
MENOMINEE
(CHARLEVIOX CO.)
(LEELANAU CO.)
EMMET
CHEBOYGAN
PRESQUE ISLE
CHARLEVOIX
ANTRIM
OTSEGO
MONTMORENCY

# MICHIGAN